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The AUTOMOBILE

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No. 24

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XXXVII NEW YORK—THURSDAY, DECEMBER 13, 1917—CHICAGO No. 24

No Labor or Steel Shortage at Present

Steel Makers Say There Is No Shortage—Secretary Wilson Reports on Labor—Council of National Defense Reorganized—Liberty Engine in Production—Talk of a Standardized Motorcycle—Economy Board Calls Dealers to Capital—Munitions Syndicate in Formation

WASHINGTON, D. C., Dec. 12—The past week has been a favorable one for the automotive industries so far as their relation to the government is concerned, and while government operation of railroads and perhaps coal mines has been very much in the air, the various government committees having to do with industries are each week becoming more cautious in their attitude towards industries. There are still a few government departments, and a few committees, some connected with the Council of National Defense, that do not see the essential aspect of the automobile industry. There are enough committee men who see the essential aspect of the industry and the necessity of keeping industries not only intact but in robust condition, to generally suppress any spasmodic attacks that are made against the industry.

The placing of orders for the assembly of 9500 Class B standardized war trucks by the Quartermaster's Department gives a good indication of how generous this department is going to be in distributing the orders over a great many manufacturers. Giving a great many orders for the assembly of 500 trucks to each factory has the desired advantage of keeping a good number of factories in healthy operating condition. The fact that many truck manufacturers, some of whom were originally opposed to the standardized war truck, have been given contracts can only be accepted as an approval of the policy of the Quartermaster's Department in the design of the truck. The sample trucks are still continuing their road tests, having now had more than 3000 miles to their credit without mechanical defects of any nature being found.

Liberty Engine in Production

There is some disappointment in that the Class A truck, which was to have been assembled last Monday was delayed by late arrivals of parts, a condition not due to the manufacturer but to the time required because of details connected with ordering such parts through government channels. The assembly of this first truck of this class will be delayed a week or perhaps ten days.

There is very general satisfaction that one manufacturer of the Liberty engine has got into production and while the daily production is not large, it is expected to soon be in double figures. The first

Liberty engine produced on production lines was completed on Thanksgiving. All tools, jigs, etc., required for production were used in the manufacture of this one. It is not surprising that Packard should be the first maker of these engines to get on a production basis. It is expected that the Trego Motor Corp. will soon be on a production basis. It is a new record in American manufacture to complete the first engine and assemble it on July 4 and be in production by Thanksgiving. The history of the Liberty engine will make interesting reading. It was laid out in 5 days. The sample engines were made in 29 days, and from July 4 to Thanksgiving was required to get on a production basis. Liberty engines are being continuously tested and are showing up wonderfully well. It is reported that in tests they are showing a horsepower for less than 2 lb. of weight, which would seem to be a better showing than that obtainable in the best European engines of similar design.

Motorcycle Standardization

In the motorcycle field it is probable that greater steps in standardization will be made than has as yet been contemplated. The motorcycle manufacturers have made wonderful progress in co-operating with the government in standardizing parts of their machines. It would not be surprising if a complete government standardized motorcycle might be asked for that would fill a similar place in the industry to the Liberty engine or the standardized war truck.

The Automobile Industries Committee, which has now been in operation a month, has not made the progress it was expected would have been made in that length of time. The committee has not been idle. It has had many obstacles to contend with. It has been doing a great deal of preliminary work and now has a force of engineers keeping in touch with the different government departments finding out what kind of work the government is in need of so that those automobile factories that are not producing automobiles at capacity can take up the manufacture of these different jobs. The committee has a meeting with the members of the Motor & Accessory Association in Detroit on Friday, and this should have a good influence in stiffening the vertebrae of many of the manufacturers and further convincing them that they are engaged in manufacturing for an essential industry.

Another example of this committee's activities is that this week it is visiting Detroit for the purpose of organizing a syndicate of manufacturers to manufacture shells. During the past 3 years many concerns have not been successful in the manufacture of shells and the fabulous profits talked of have not materialized. As a result there are many firms not overanxious to manufacture shells. The Automobile Industries Committee has in mind the organization of a manufacturing syndicate in Detroit with a capitalization of perhaps $2,500,000. This capital would largely be taken up by twelve or fifteen Detroit manufacturers who might subscribe perhaps $50,000 each. It is rumored that the government might lend financial assistance to the extent of securing a building. There are several possible buildings available, among which might be mentioned the new Saxon factory which has not been completed, or the Springfield Body Co.'s new building. Such a syndicate could do considerable sub-contracting with relatively small firms whom the government would not care to deal with direct. There is a sentiment in government circles against placing small ammunition contracts. This means that small concerns having factory slack will have to look for sub-contracts.

TWO OF THE MOST CHEERFUL CONDITIONS IN WASHINGTON ARE THAT THERE IS PLENTY OF STEEL AND NO ACUTE SHORTAGE OF LABOR. THOSE IN FAVOR OF AN EMBARGO ON STEEL BECAUSE OF STEEL SHORTAGE SUFFERED A LOSS OF POWER LAST MONDAY WHEN THE STEEL KINGS, MEETING WITH THE WAR INDUSTRIES BOARD, TOLD THE MEMBERS THAT THERE WOULD BE NO SHORTAGE OF STEEL AND THAT THEY NEED HAVE NO WORRY ABOUT STEEL FOR MUNITION MANUFACTURE.

ALSO, THE SCARCITY-OF-LABOR AGITATORS HEARD THAT THE LABOR SITUATION APPEARS TO BE IN GOOD SHAPE, WHICH SHOULD FOR THE TIME BEING PUT AN END TO THE HYSTERIA ABOUT STEEL AND LABOR.

IN A REPORT BY SECRETARY OF LABOR WILSON IT IS STATED THAT THERE WILL BE NO NEED FOR CONSCRIPTION OF LABOR DURING THE WAR, AND THE SECRETARY ADDS THAT HE DESIRES TO THROW HIS WEIGHT AGAINST ANY SUCH MEASURE. IT IS QUITE LIKELY THAT HIS WEIGHT PLUS THAT ALREADY THROWN WILL BE ENOUGH.

The last week has witnessed the Council of National Defense enjoying a quiet little revolution all its own. There has been a revolution of thought, a revolution of opinions, a revolution of membership. The notions of drastic curtailment and non-essential industries have been defeated. The opinions of steel shortage and scarcity of labor have been routed. The many sub-committees, often acting both as Government agents and industry representatives, and frequently in embarrassing or tempting positions, have resigned.

Horning Has New Duties

A new scheme with individuals acting as representatives for both the Government and the industries, and with wide powers and scope, is quietly being inaugurated. These individuals, each an authority in his own industry, will exercise their power on all matters including priority, production and purchases, as regards their different industries. H. L. Horning, who was chairman of the Automotive Products Section, now becomes the War Industries Board's representative for automobiles, trucks, military tractors, motorcycles, motors and accessories, airplane parts, motor boats and gas engines, and not only will he have supervision over these industries so far as concerns purchases as heretofore, but also production, priority and all other Government interests.

And in the future before the priority board, fa-

mous for some of its past priority rulings, issues more such orders, it will through Mr. Horning investigate the need and the result of such an order as regards matters automotive. This scheme, properly pursued, should be an excellent brake on those Bolsheviki in the Council who have thought that priority orders were a cure-all for everything; that when anything was wrong all one had to do was write a priority order and make it right—which, judging by some priority orders suggested, and others issued, would seem to be the only basis for their issuance.

The President's request for concentrated purchasing activities has created another of the revolutions and the Council now plans soon to organize through its expert individuals a purchasing commission that will buy everything needed by every Government department. The President has conferred Presidential powers upon the War Industries Board of the Council, in much the same way as a very busy manufacturer delegates a part of his power to his secretary, and it is anticipated that the purchasing revolution will be a radical one differing considerably from the present methods.

Among the many rumors of the Council is one to the effect that Coker F. Clarkson, secretary of the Society of Automotive Engineers, will collaborate with H. L. Horning. The rumors do not say whether Mr. Clarkson will accept, or whether he will give up his work for the Society of Automotive Engineers.

One of the many reports spread about regarding the Liberty engine is that when the thousand ordered are completed they will be a year behind the time. The Aircraft Board admits this, but also admits that it is not gifted with prophetic vision, is unable to know what will be new a year hence, and believes it will be better to have 40,000 or 50,000 airplanes a year old in design ready and combatting the enemy in place of possibly 10 new airplanes.

(*Continued on page 1036*)

British Government Co-operating with Its Industries

Research Associations to Be Established in Many Industries—Government Gives Financial Aid

(*By Staff Correspondent*)

THE following opinions from our staff correspondent in London concerning the automobile industry in Great Britain but further reflect the statement published three weeks ago in these columns, to the effect that the British government now considers the suppression of the passenger-car industry a matter of imperial concern. The establishment of research associations for many industries by the British government, and largely backed by government money, shows the method already under way to rehabilitate industries that have suffered unduly because of the war. The establishment of these research associations further suggests the program of rehabilitating and strengthening its industries which the British government has under contemplation, not only for the British Isles, but throughout the entire British Empire. This work suggests the cardinal importance of keeping the American automobile industry in a robust condition, as all industries must be kept during the present war period. Our industry must be sufficiently strong during the war and after the war to establish its supremacy for export trade in neutral countries, as unquestionably many of the allied nations will have to create tariff barriers; and it must not be considered unfriendly on the part of one ally against another for taking such action.—EDITOR.

LONDON, Nov. 15—While it seems almost impossible to get the British government to realize that the motor vehicle is not in essence a luxury, but is an absolute necessity, and a means of speeding up development by effecting economies in transport, the government is awake to the fact that the automobile industry must receive very important consideration during the remainder of the war, as well as during periods of peace reconstruction.

In this latter work the British government has already plans under way to help industries, including the automobile, in the most generous and open-hearted manner. This is the sphere of joint industrial research, in which British motor manufacturers have not in the past shown themselves extremely active. Briefly, the program of the government is to encourage the institution of research associations, the membership of which will be manufacturers, all interested in some particular industry or group of industries.

One of the organizations now under discussion is a Research Association to deal particularly with questions relating to internal-combustion engines. Here the motor manufacturers are deeply interested, but this research cannot cover the whole of their requirements, since it excludes investigations into such matters as springs, frames, or wheels.

The suggestion of the government is that the manufacturers themselves in each industry will subscribe to their own research association. The government will then add a sum of money which will not exceed but may equal that subscribed by the manufacturers. Moreover, the manufacturers' subscription will be regarded as expenditure out of income, and so will not be liable to taxation. The bulk of the British automobile manu-

facturers are at present doing sufficiently well to be liable to taxation on various grounds, which has, in the aggregate, the effect of converting to the use of the government some 80 per cent of the greater part of their profits.

It follows that if the subscriptions to a Research Association come out of income, the government in effect relinquishes the claim that it would otherwise have upon some 80 per cent of the sum thus expended. Out of $2,500 contributed by the monufacturer, $2,000 would have gone to the government if it had not been used in this way. If to this fund for research the government adds another $2,500 of its own, then for the time being no less than $4,500 out of $5,000 really comes out of the government's pocket. The generosity of this offer is beyond question, and it cannot fail to act as a tremendous inducement to manufacturers to take up this question of joint research in a very serious and comprehensive manner.

It will be noticed, however, that official generosity takes in part the rather doubtful form of conscripting profits, and then returning a portion of the money provided that the manufacturer consents to use it in a certain way. Motor interests in Great Britain will sympathize with those in the United States which naturally resent the special taxation of all motor vehicles as a war measure.

It is, of course, an open secret that British automobile manufacturers hope to find their industry protected after the war by an adequate system of import duties. In the main, they are inclined to ask for temporary rather than permanent duties. In other words, they do not base their proposals necessarily on a complete belief in the general principles of tariffs but on the conviction that the conditions caused by the war will make exceptional measures, even if undesirable in principle, essential in practice for some years after the war is concluded.

America a Strong Competitor

It is well to recognize candidly that, so far as competition in automobile manufacture is concerned, the British manufacturer is much more afraid of the United States than of any other country. This is, of course, a compliment, and as such is well deserved. Among those in Great Britain who still honor the principle of Free Trade as though it were a religion, it is somewhat common to suggest that it is impossible to give our essential industries the protection of a tariff wall, because any such action would be regarded as extremely unfriendly by our present Allies. In this connection, some of the remarks made by George E. Roberts of the National City Bank of New York in his address before the Editorial Conference in New York City, as published in AUTOMOTIVE INDUSTRIES, are noted with considerable interest in the British Isles. Particularly I refer to the following brief quotations:

> "The right of each country to protect and develop its own industries, with a view to safeguarding its supply of necessaries and of diversifying its production, cannot be questioned."
>
> "The whole world is short of goods of every description, and our industries will be more completely ready to supply those wants than those of any other country."

These are the expressions of the logical opinion of a clear-headed business man skilled in questions of finance. They mean what we must all admit, unless we are hopelessly prejudiced by our political tenets, namely, that there is no question of unfriendliness in the action that may be taken by any country to render permanent its own essential industries, particularly when its friends, who are also its competitors, have an advantage over it which must be neutralized before equal competition again becomes possible.

Mr. Roberts referred also to some of the steps that are being taken by the British government to improve its consular service and to assist manufacturers to develop their markets. These are spheres in which there is plenty of room for progress.

With the exception of the special taxes which have to be paid by those firms working under the control of the British government, and by all firms in respect to excess profits, the main complaint of motorists in the British Isles since the outbreak of war has been that they have been required to pay extra taxes, particularly on their motor fuel, and then have been prevented from getting or using the fuel on which the tax has been paid.

Gasoline Tax Doubled

The British gasoline tax was originally imposed for the specific purpose of creating a fund for road improvement. The tax has now been doubled, and the proceeds diverted to the national exchequer, so that the whole underlying principle has gone by the board. This is all very well in emergency, but we are waiting rather anxiously to see whether, when the emergency is over, a return to the old state of affairs will come about automatically, or will need very strong concerted action by motorists. Even now we do not much like paying a license duty which is supposed to permit us to use our cars for a year, and then being prevented from using them by an almost total prohibition in the matter of fuel. Some of us can, of course, fall back on our new fuel, coal gas, but in the present stage this is not suited for cars which have to be driven over considerable distances. Meanwhile, as a means of maintaining motor-coach services and enabling closed cars, mainly used in towns, to be kept in commission, it is unquestionably a godsend.

We cannot yet tell for certain whether coal gas will figure as a permanent and serious competitor of gasoline in all fields. At present it enables some vehicles at least to run at about a quarter of the fuel cost involved if gasoline be used. Probably it will always have the advantage as regards comparative price, but this advantage has to be set against a varying degree of inconvenience and additional weight.

The British government does not appear to take any deep interest in the possibilities of alcohol as a motor fuel, and probably the distilling interests, coupled with those of customs and excise, will hold these improvements back for a long time to come. This despite the fact that there are many expert agriculturists who consider that by the extensive growth of alcohol the agriculture in Ireland could be tremendously assisted.

No Labor or Steel Shortage at Present

(*Continued from page 1035*)

The Civil Aerial Transport Committee issuing a statement about airplane use following the war should find interest among motor car makers and dealers. The air planes, the many thousands of aviators and the airplane factories have come to stay, and wise makers and dealers will soon give thought to the subject and make their plans accordingly. This country will witness rules of the air, thousands of landing places and airplane stations created before the close of the war and they will observe shortly after peace is declared hundreds of thousands of airplanes and aviators working at mail, freight and passenger service—and the intelli-

gent makers and dealers will have arranged to handle that part of the vast business that is coming with this revolutionary business plan.

Dec. 17 will witness the setting of the first rivet in the keel of the first fabricated steel ship constructed under the program of the Emergency Fleet corporation. Soon after that we may again hear from those who think there is a shortage of steel and who think the best way to build up steel production is to tear down industries—and it might be an excellent plan now to investigate thoroughly the exact steel situation, learning those plants that are suffering from a lack of orders—as many are—and the exact steel production and Government requirements to use against a further steel shortage hysteria.

A. W. Shaw, chairman of the Commercial Economy Committee of the Council of National Defense, has issued a call to several automobile dealers' organizations, notably associations in New York, Boston, Chicago and Cleveland, asking them to meet him on Dec. 19 in Washington. It seems that Mr. Shaw looks upon the continued sale of passenger automobiles as nothing short of a catastrophe, although he does not seem to be familiar with the fact that several concerns are producing up to capacity and that they still cannot meet the demand from many parts of the country. Mr. Shaw has thoughts of stopping free service and many other matters connected with the industry with which it would seem he is not sufficiently familiar.

Perhaps a similar outburst of this nature came from Julius Rosenwald of the Council of National Defense, when he too had a similar vision. Fortunately there are enough men connected with the Council of National Defense organization to understand that to win the war our industries must be kept intact, to convince Mr. Rosenwald of the error of his views concerning the so-called luxury viewpoint of the automobile industry.

It is unfortunate that when the automobile dealers throughout the country are called upon at such a time as this to go into conference that they have not a representative national organization to present their views. There is no time when a national dealers' organization is more necessary than to-day. There is no time when these dealers should get together before going to Washington and get a correct vision of the industry. Unfortunately, such an organization in practical working form does not exist and it would not be surprising if a presentation of the case by the dealers is not nearly so potential as the situation merits.

All Fiats Now Have Steel Wheels

Passenger Cars and Trucks Use Wheels Made in Fiat Plant

PARIS, France, Nov. 7—In the Oct. 4 issue of AUTOMOTIVE INDUSTRIES there appears an article by A. Ludlow Clayden entitled "Wheels Will Be Metal," in which it is stated that the Fiat Co. is a user of the Michelin disk wheel. This statement is incorrect. The Fiat Co. at Turin, Italy, has been producing for a considerable time a steel disk wheel for pneumatic tires, and has supplied thousands of automobiles with this type of wheel to the various Allied armies. Although having a general similarity with the disk wheel produced by the Michelin Tire Co., in France, the Fiat production is entirely distinct, having been designed by Fiat engineers and built throughout in the Fiat shops at Turin. It is nothing more than a coincidence that the Michelin Co. should have introduced a similar type of wheel on the French market.

The Fiat disk wheel is being used on pneumatic tired 1-ton and 1½-ton chassis. These latter are used to the exclusion of all others in the Italian air service, also to a very large extent in the French air service. The 1½-ton aviation truck is employed for carrying a useful load and also as a tractor hauling aviation trailers. After having proved its worth in the Italian and French air services, it has been adopted by the American air service in France.

This type of wheel has proved ideal under the most strenuous war conditions. Tire equipment is 880 x 120 (34 x 4½ in.), with singles on front and duals on the rear wheels. The airplane squadrons are equipped exclusively with the 1½ ton fast tractor, the heavier haulage with 3½-ton trucks being taken care of by other organizations to the rear of the squadrons. In the Italian air service, as well as in the French service, it is usual to carry two spare wheels, but no spare tubes. With this combination the driver changes wheels but never needs to change tires on the road. If he should experience more than two punctures, it is always possible to run with one of the duals in a deflated condition.

These wheels are held on by five bolts and nuts. Wheel changing is not as quick as with wire wheels, but need never occupy more than three or four minutes, and there is the advantage that the mechanism is very simple and impossible to get out of order. The European armies now refuse to accept wood wheels. The steel disk type is stronger than the best wood wheel, it allows of quick changes, and it is not liable to be damaged by shell splinters or by fire. An advantage of duals over big single tires is that they give a guarantee against skidding. Experience has shown that it is possible to work on greasy and snow-bound roads with dual pneumatic tires when those same roads could not be negotiated with single pneumatics.

The Fiat Co. endorses your general statement that wheels will be metal. This company, which is now the biggest automobile producing factory in Europe, with a staff of 25,000 workpeople, has thrown the wood wheel overboard. Touring cars are fitted with detachable steel wheels of the Sankey type; fast trucks are supplied with pneumatic tired disk wheels; heavy trucks of 2-, 3½- and 5-ton capacity are fitted with hollow spoke cast steel wheels and band tires. All disk and cast steel wheels are produced in the Fiat Co.'s own shops at Turin. One foundry casts steel wheels only.

Although Fiat has led Europe in the metal wheels idea, objection must be taken to your statement that France has remained faithful to the wood wheel. Practically no French trucks are now built with wood wheels. —*Fiat Press Bureau, Paris.*

Aims Another Blow at Industry

A. W. Shaw of Commercial Economy Board Without Sufficient Thought Cries Curtailment—"Original Views" Not Likely to Be Accepted

ANOTHER industrial bombshell has been exploded in the Council of National Defense. It is aimed at the automobile industry.

The monument of safe and sane industrial conservation erected in the past weeks by common agreement between members of the War Industries Board and representatives of the industry was attacked yesterday by A. W. Shaw, chairman of the Commercial Economy Board, when in reply to inquiry for the cause of the meeting called by him for Wednesday, Dec. 18, of the automobile dealer associations to send representatives to Washington, he used practically the same expression of curtailment of non-essentials that had first been heard from those Council members who had declared themselves opposed to drastic curtailment or the stigmatizing of any industry as being non-essential.

Mr. Shaw told the Washington representatives of AUTOMOTIVE INDUSTRIES yesterday that his proposed meeting was for the purpose of placing what he called the "facts" before dealers and to arrange for a scheme which would be ready for that time in the future when he believes it will be necessary for dealers to give up their agencies and pool their businesses.

Views Conflict with Opinion

His views of the present industrial situation and of labor and material conditions conflict with everyone else in the industry and the representatives of AUTOMOTIVE INDUSTRIES carried the matter in the form of a protest to H. L. Horning, chairman of the Automotive Products Section of the War Industries Board, addressing to him the following letter:

"This morning I called upon Mr. A. W. Shaw, chairman of the Commercial Economy Board, to find out the purpose of a call issued by Mr. Shaw to various automobile associations to send representatives to his office for a meeting Wednesday, Dec. 18. Mr. Shaw has told us that he believed the automobile industry is suffering approximately 50 per cent loss of business and that it will be curtailed an additional 50 per cent by the Government, which would mean a reduction to about 25 per cent of normal. He believes that the Government needs automobile plants for the manufacture of munitions and must have 1,000,000 men from the industry for war work.

"He believes that if the industry sold its normal quota of passenger cars to the public it would thereby perform great harm, and states that the public must devote its money to other purposes, and that it would be injuring the nation's welfare if it spends its money for passenger cars.

"He disregards the material situation and the immediate present, saying that regardless of what these are now we must conserve our material for future need. He attempts to draw a parallel between the steel market and the wool market despite the fact that wool is imported while steel is a home industry.

Facts ? ?

"He states that the meeting called for next week for the purpose of placing these 'facts' before the representatives of the automobile dealers and to arrange preliminary schemes, will be devoted mainly to taking up methods for use some time in the future when it will be necessary for dealers 'to give up certain stores and agencies and pool their businesses.'

"He attempts to draw a parallel between American and English automobile industrial conditions despite the enormous discrepancy between the two. He states that he has talked this matter over with Roy Chapin and Hugh Chalmers.

"He denounces the automobile industry for trying to learn if there really is a justification for curtailment by saying that the present effort of the industry to resist drastic curtailment and classification of non-essentials will meet with great disfavor in public opinion if the industry persists in its present attitude.

Claims Treasury Support

"He stated that Secretary of the Treasury McAdoo and Mr. Frank A. Vanderlip were in accord with his views and called those who were not in accord with him unthinking men by frequently saying that 'All thinking men here in Washington are of the same opinion' as he.

"We pointed out to Mr. Shaw without any considerable success the apparent lack of need for drastic curtailment, the lack of war contracts and the lack of need for wholesale conversion of the automobile industry, the vast difference between the American and English automobile industry, and the great ne-

cessity for continuation of general prosperity, of all industries in this country and also the present real prosperity of a number of automobile factories.

"Yours very truly, AUTOMOTIVE INDUSTRIES,
(Signed) "Washington Editor."

Following the receipt of this letter, Mr. Horning, considerably exercised at seeing the work of several weeks for a sane handling of the industry in danger, called in Alfred Reeves, General Manager of the National Automobile Chamber of Commerce and asked him to take the matter up with Mr. Shaw.

Mr. Reeves found Mr. Shaw's views practically the same as reported to Mr. Horning in the foregoing letter, and following this Mr. Horning addressed a letter of protest to Walter E. Gifford, director of the Council of National Defense, together with a letter from Mr. Horning stating that the accompanying letter of protest shows that Mr. Shaw

1. Does not understand the situation.
2. Puts back conditions to where they were a month ago.
3. Does not agree with Mr. Gifford's views and statements.
4. Does not understand the genuine patriotism of the automobile industry.
5. Does not know the real situation as regards the duties of Mr. Horning or the Automobile Industries Committee.

To Halt Individual Folly

Following the receipt of the letter, Mr. Gifford issued a general order through the Council to the effect that in the future all publicity emanating from the Council must pass his approval. This practically means that in the future any member having views opposing those of the director or of the council will have first to submit his views, and unless they are convincing, he will be unable to make them public or issue any such calls for meetings as this call for the meeting of automobile dealer representatives.

Mr. Shaw's idea is to follow up the same plan as has been inaugurated in England. He calls attention to the methods used in England continually, and in so doing gives no attention to the fact that the automobile industry and dealer industry of England cannot be compared to the American industry in size.

English Example Useless

Daniel Willard, speaking before the Chamber of Commerce, said yesterday: "It is impossible to draw comparisons between the United States and England because of the smallness of Great Britain and the vast geographical limits of the United States."

Mr. Shaw apparently did not know of the Automotive Products Section of the War Industries Board or that H. L. Horning, chairman of that division, is the representative for all automotive matters, for he did not take up the matter at any time with Mr. Horning. So far as the labor shortage is concerned. Mr. Shaw will no doubt be interested to learn that at the present time it would be, according to the Department of Labor, a difficult matter to place 100,000 workmen, much less the 1,000,000 that Mr. Shaw proposes to take from the automobile industry, and his argument that the government requires the automobile factories for munitions manufacture does not coincide with the fact that the Automobile Industries Committee working here to secure government contracts, for the industry, is finding these contracts all being placed outside the automobile industry.

Workless Labor

It is interesting also to note in view of the cry of labor shortage that in the city of Jackson, Mich., where the urgent talk of curtailment had a most serious effect, practically every plant was closed. There are thousands of skilled and unskilled workers seeking jobs at any form of labor. The fact that the Automobile Industries Committee knew of Mr. Shaw's views as long as ten days ago and did not consult with H. L. Horning before, bears out the statement made in this paper several weeks ago that there is not a proper co-operation between the committee and Mr. Horning.

It is quite likely and indeed practically certain that Mr. Gifford as Director of the Council and as opposed to such views as taken by Mr. Shaw will use his influence to call off the proposed meeting and to prevent similar happenings in the future. The Council of National Defense and the War Industries Board have shown themselves to be fair-minded and sane on the subject of industrial conservation and may be expected to continue their sane fairmindedness.

Employees' Benefit Organizations

EMPLOYEES of the Reo Motor Car Co. have a benefit association to which they contribute 10 cents a week or 20 cents every pay day. In case of sickness, after a man is off seven days, he receives $1 a day for 60 days; if the lay-off is caused by an accident he receives benefits from the start. The sickness benefits continue for 60 days if the man has to keep away from work for that length of time. As death benefits the association pays $50 to a man's wife or his beneficiary. Any child under 16 years of age receives $25 at his death. This applies to a man regardless of the length of time he has been in the employ of the company. The association is entirely conducted by the employees.

In a similar association reported on by Michael Barratt the men pay 75 cents entrance fee and 25 cents per month in dues. In case of sickness they receive $5.50 per week for 7 weeks and in case of death $100, the latter amount being paid to whoever is named as beneficiary. Membership in the association is voluntary. In order to stimulate interest in the association, a prize of $10 is being offered to the department collector who secures the greatest number of members in any one month.

There is also a benefit association at the Packard company, but in this case no initiation fee is required. When a man joins he pays down his 25 cents for the first week, and if he becomes ill, after the first week he receives $7 per week. In case of death, if there are any dependents, $100 is paid to the wife and $20 to each of the children. When a man is sick he is not expected to pay dues, and when he comes back to work he is not expected to make up for the dues that accumulated while he received benefits, but immediately he gets back to work and draws his pay he begins to pay the regular dues again. At the present time about 47 per cent of the men in the plant belong to the association, membership in which is entirely voluntary.

Standardize Many Tractor Details

Fastening of Lugs Facilitated by Standard Wheel Rims—Will Mount Magnetos on Non-Magnetic Bases—Pulley Widths

THE field of work before the Tractor Division of the Standards Committee is a large one but progress must naturally be slow for some time to come. Not many definite steps were taken at the meeting held at the Radisson Hotel in Minneapolis on Wednesday, Dec. 5, but work done in many different lines was reviewed and plans for continuing it were laid. One thing that was settled upon definitely, so far as the division is concerned, is a short specification form for use in tractor catalogs.

The meeting was opened by Standards Manager Hanks shortly after 10 o'clock. He announced that the American Society of Agricultural Engineers had been invited to co-operate in the work of the division; this invitation had been accepted and J. F. Max Patitz of the Allis-Chalmers Co., Milwaukee, Prof. L. W. Chase of the University of Nebraska and W. F. McGregor had been appointed to represent the A. S. A. E. on the division. Owing to his pressing duties at Washington, H. L. Horning had to resign as chairman of the division. He is succeeded by Dent Parrett of the Parrett Mfg. Co., Chicago. Mr. Parrett presided at the meeting after it had been formally opened by Mr. Hanks.

Standard Wheel Rims

Mr. Green made a report for a sub-committee on drive-wheel rim punching. Among the recommendations were that all sizes of rims be punched with 11/16-in. holes for lugs; that standard rim widths run in even multiples of 4 in.; that tractor rims be cut to lengths in even numbers of feet and that the spokes join the rim at distances 12 in. apart; that holes for the lugs be midway between spoke holes and 2 in. in from the edge of the rim, and that there be an additional row of holes for lugs at the middle of the rim.

This design would admit of different methods of fastening the lugs or cleats and of reversing the wheels. It was explained that on tractors with live axles it would probably be found desirable to have the thrust due to the cleats on the wheels in an outward direction, while in the case of tractors with dead axles this thrust could be taken care of most readily if it were directed inward. There are now a number of different rim profiles. These are in the shape books of the steel companies and cannot be changed easily. By locating the outer lugs holes 2 in. in from the edge the lugs need not interfere with the flanges formed on some rims. The report was accepted as one of progress.

A report on standard specification forms was made. This contained two forms, one referred to as condensed specifications, chiefly for use in catalogs, and the other complete specifications, for use by engineers in collecting and preserving tractor data.

The condensed specifications form was accepted by the division after a prolonged discussion centered mainly around the question as to whether the drawbar pull should be given as that corresponding to the S. A. E. standard plowing speed of 2 1/3 m.p.h., or as that corresponding to the actual plowing speed of the particular machine.

In order to obviate all possibility of misunderstanding, it was finally decided to state under the same head the normal plowing speed of the tractor and the drawbar pull in pounds at the normal plowing speed and at the S. A. E. horsepower rating. It was also decided to provide space in both the condensed and the complete specifications blanks for both the S. A. E. rating of the tractor and the rating according to the present method, which is to be known as the old trade rating.

The idea is that this latter rating shall be dropped entirely as soon as possible but that owing to its use in catalogs, etc., it cannot be dropped all at once. The complete specifications were referred back for further elaborations to a committee composed of Messrs. Parrett, Funk, Patitz and Greer.

No report was ready on the subject of nomenclature and the matter was referred back to the committee. Some misunderstanding arose in regard to the magneto dimensions report, but it was finally made clear that it was not intended to standardize impulse starters for magnetos but only to fix upon the minimum space that should be allowed for these. This involves two dimensions, and the report was adopted.

Joseph Van Blerck read a report on the subject of the standardized crank-pin bearings containing a list of proposed sizes. Mr. Van Blerck pointed out, however, that he saw great difficulties in the way. On account of differences in lubricating systems it would be impossible to provide oil grooves in the bushings that would be suitable for all engines, and there is the same difficulty with respect to mounting of the bearings.

Sizes of Bearings

In a written discussion by Mr. Horning attention was called to the tendency to go in for more rigid crankshafts, which resulted in relatively short bearings, and this tendency was not sufficiently taken account of in the proposed list. Objection was also raised to the proposed standardization on commercial grounds, as it would likely result in catalog houses offering cheaply made bearings, which the former might buy in order to save a few cents, unmindful of the fact that fitting an unsuitable bearing is a quick and sure method of ruining an engine. A motion was therefore introduced and adopted to the effect that it was the sense of the meeting that no attempt to standardize bearing bushings should be made at the present time.

After a recess, Mr. Williams of the K-W Ignition Co. spoke on magneto mountings. On tractor engines cast-iron brackets are now often used for the magneto, and these form a magnetic shunt across the armature and tend to weaken the magneto. Most magneto manufacturers provide a brass pad at the bottom of the magneto to insulate it magnetically from the base, but in some cases this pad is not sufficiently heavy to prevent considerably magnetic leakage.

It was therefore moved by Mr. Williams—and the motion was duly seconded and carried—that in the event a cast iron or other magnetic supporting bracket is issued, a shim at least ½ in. thick, of brass, aluminum or other non-magnetic material, should be used and furnished by

the engine manufacturer; also, bronze bolts should be used to secure the magneto to the bracket.

Some time ago a sub-committee on screws and bolts was appointed and instructed to look into the question of the possibility of eliminating in tractor construction all bolts of an uneven number of sixteenths of an inch in diameter, above 1⅜ in. No report was made. R. E. Greer of the Emerson-Brantingham Co. offered the information that originally they used U. S. bolts and screws exclusively. It was soon found that these would not serve for many purposes. S. A. E. screws were then substituted in these places and in order to prevent confusion only S. A. E. screws running in odd sixteenths were used. Later, however, it developed that some of the bolts running in eighths of an inch had to be fine thread, with the result that now all sizes of U. S. and S. A. E. bolts are used indiscriminately.

It is believed to be perfectly feasible in tractor construction to use S. A. E. bolts only in odd sixteenths above say ⅜ in. and U. S. bolts only in eighths. The advantage of such a practice would be that a country repair shop could get along with a much smaller equipment of taps and dies and that tractor users would get better service. The matter was referred back to the committee for further consideration.

Power belt widths was the next topic. M. W. Hanks had brought with him a table compiled at a conference of belt makers in New York. This table gave desirable widths of belts, based on a pulley speed of 2600 ft. p.m., for different horsepowers to be transmitted and for four-, five- and six-ply belts. In a footnote minimum pulley diameters for the different numbers of plies were given.

This table was objected to by Fred Glover of the Emerson Brantingham Co. for the reason that far more belt sizes than necessary were listed. The important thing for the tractor designer to know is the required width of pulley. Pressed-steel pulleys are generally made of a width of face equal to the belt width plus ⅜ in. Mr. Glover held that three widths of pulleys would serve the requirements for practically the whole range of tractor capacities. Mr. Glover introduced the following resolution:

Pulley Speed 2600 Ft. per Minute

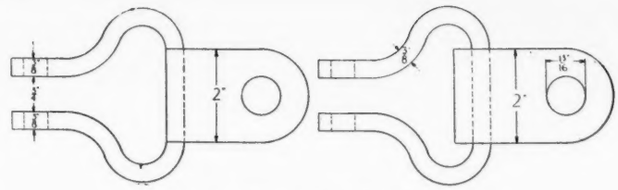
"We recommend that tractors be equipped with pulleys giving a belt speed of 2600 ft. p. m., figured at the crown of the pulley; that as large pulleys be used as possible and that the widths of the pulleys vary according to the horsepowers delivered as per the following table:

Below 20 hp.....6½ in.
20-30 hp. inclusive.....7½ in.
Over 30 and up to 70 hp.....9½ in.

Hanks was instructed to circularize this recommendation among tractor makers for criticism before final action is taken on it. A footnote is to be added to the effect that it will enhance the operating conditions if the pulley is made as large as possible.

A sub-committee on standard draw-bar couplings had had a number of samples made up as per the accompanying drawings. As will be seen, one is in a single piece and the other in two pieces. The latter, which is made from 2 x ⅜-in. strip, is materially cheaper to produce, as there is no waste. Tests of these samples were made at the mechanical engineering laboratory of the University of Minnesota. Both practically gave way at 20,000-lb. pull.

The design of the two-piece coupling allows of a deflection of 57 deg. before binding begins. These couplings are designed for a pull of 5000 lb. and therefore have a factor of safety of about 4. The stock is ⅜ x 2 in. and the hole for the ¾-in. pin is drilled 13/16 in. with its center 1 in. from the end of the strip. It was decided that E. R. Greer should embody the recommendations regarding the clevis design in the form of a description letter which is to be circularized by the New York office of the S. A. E. among tractor makers.



Suggested standard drawbar hitch

The clevis is designed for a 2 x ⅝-in. drawbar. The tractor drawbar is to be placed horizontally. Adjustment for height is to be made on the plow by means of a series of holes always provided, and lateral adjustment, as required, for instance, when a two-bottom plow is to be substituted for a three-bottom plow, by a similar set of holes on the tractor.

It was when the subject of a standard tractor spark plug shell was taken up that the tractor division suddenly realized the full weight of its responsibility, and the need of proceeding cautiously. The division had already voted to adopt the metric size spark plug shell as standard and only a few dimensions remained to be approved. Hanks stated that this shell would be used on all airplane engines, on all motor-cycle engines, on Liberty truck engines and probably eventually also on all passenger-car engines.

Want Metric Plugs Tried

However, it seemed that no spark plugs of these dimensions had ever been regularly used on a tractor engine in this country and as they are certainly not obtainable at supply stores at the present time, it was apparent that the action had not been warranted. It was agreed that the present types of spark plugs were not entirely satisfactory when kerosene was used, but there was no unanimity as to whether the smaller plug would be better. As the metric plug is especially designed for efficient cooling it should be superior to the old S. A. E. plug on that score, but some members felt that the smaller porcelain would become fouled quicker.

Greer said he tried the metric plug on a kerosene-burning engine, and found that he could run it without water injection, whereas with the old plugs water had to be injected to prevent preignition. One tractor manufacturing company, it was brought out, uses a special spark plug with a ¾-in. pipe thread, which is larger than any other spark plugs in commercial use. The reason for this is that it withstands better the effects of such tools as the former is likely to use upon it. A sub-committee consisting of Messrs. Greer and Buffington was appointed to carry out spark-plug tests.

Carbureter Flanges

Next the subject of carbureter flanges was taken up. Many kerosene carbureters are very much heavier than the corresponding size of gasoline carbureters, and it has been found that the standard S. A. E. carbureter flanges are not heavy enough. When drawn up tight, the flanges will sometimes spring, with the result that the pressure is removed from the gasket locally and it blows out.

One of the reasons for the trouble experienced, it was explained, was that, although the S. A. E. specifications called for a ribbed flange, many makers did not rib it.

(*Continued on page 1068*)

Tractor Men Discuss Electrical Equipment

Papers on Metric Starting and Battery Ignition Provoke Long, Sharp Discussion at Meeting of Minneapolis Section S. A. E.—Starter Men Optimistic, Tractor Men Skeptical as to Future of Electric Starters on Tractors—Battery Ignition Doubted

THE meeting of the Minneapolis Section was held in the Empire room of the Radisson Hotel and was preceded by a dinner. It was attended by about 100 persons. A letter was read from H. L. Horning in which he referred to the serious position the country is in at the present time and informed the section that the production of a "Liberty Tractor" had been seriously considered by the authorities at Washington at one time, but that the plan had been given up for the present.

Following the dinner two technical papers were read, one by J. A. Williams of the K-W Ignition Co. on the subject of electric ignition for tractor engines, and the other by J. A. Gelzer of the Wagner Electric Co. on starting, lighting and ignition for tractors. Both papers were discussed together, as they covered related fields, and, in fact, overlapped to a certain extent.

Lively Discussion

The discussion was opened by E. R. Greer, after an invitation to the starter men present had failed to bring results. Greer expressed the view that an electric starter had absolutely no place on a farm tractor and instead of being an advantage was an absolute nuisance. This rather drastic condemnation of the electric starter inaugurated one of the liveliest discussions that has ever been held at any S. A. E. section meeting, the debate never lagging for an instant until about midnight, when it had to be cut short by the chairman. In Mr. Gelzer's paper it was claimed as an advantage resulting from the use of a starter that if the tractor got stuck and the engine stalled the operator need not get his shoe muddy. The tractor men present seemed to be unable to see any advantage in spotless shoes for a plowman. Other criticism of Gelzer's paper made by Greer was that for night plowing there was nothing like a "good old fashioned kerosene lamp with a reflector behind it" and, besides, the battery had not yet been made which would last on a tractor for a week.

T. R. Du Bois (Bijur) was first to take up the defense of the starter. He said that the farmer had adopted electric generating equipments for lighting his home and was getting along with these; he had his electrically equipped automobile; electric equipment is being used more and more on trucks; it has entered the marine field, and now it is being applied to airplanes. Manufacturers of tractor engines should realize that although electric starters are not now being used to any extent, there may be a chance for a demand next year, and they should design their engines so that generators and starters may readily be fitted if desired.

Thinks Starter Coming

C. E. Wilson, Westinghouse, said the real question was: "Does a starter pay? Does it save fuel? Does it reduce drudgery?" There is no question but that a starter eliminates hard work. If a farmer drives an electrically equipped automobile he will feel the need of a starter for his tractor. There is this to be said against the starter, that the small tractor is often used only a small part of the season and the farmer cannot afford the investment. Nevertheless, the man who buys a Ford car, as a rule, immediately begins to look around for an electric equipment for it, and those interested in starters are very optimistic regarding its future on the tractor.

H. C. Buffington, Minneapolis Steel & Machinery Co., said the farmer feared the great amount of wiring required. Electric equipment was puzzling to him, and if something happened the farmer might be fixing his wiring all summer. He preferred the magneto because of the simple wiring system.

J. C. Habbleib, North-East, said that the wiring systems of electrical equipment had been reduced to a very simple form. Moreover, it was to be borne in mind that the wires carried only low voltage current instead of the extremely high voltage currents of ignition systems, and that the chances of trouble were consequently much less. The wires used are weatherproof and oilproof. There is no need to put the wires on in such a manner that the farmer has to fool with them. One thing that enhances the chances of the electric starter is the present scarcity of help. Tractors are often operated by 16-year-old boys who have no difficulty in driving the machine; they cannot crank the engine. Women have also begun to operate tractors, and in their case the same difficulties are met.

H. E. Adams, who had equipped three tractors with starters last year, was called upon to relate his experience. He said that the starters were now lying in one corner of the plant. When the farmers saw the maze of wires they asked to have it taken off. Adams referred to the extreme effort required to break loose large engines in cold weather, which caused farmers to call for extra men to help crank. Besides, the cost is an objection. The farmer does not want to pay any more for a tractor than is absolutely necessary.

Dent Parrett called attention to the infrequent need for a starter on a tractor. Under ordinary conditions a tractor engine is started in the morning and runs without a stop practically all day.

High Safety Factor

G. B. Stone (Remy) said that the very fact that the demands on a starter on a tractor were infrequent permitted of a high factor of safety, the same as in stationary engines will run for months on end without trouble of any kind. This also applies to the generators of electrical equipments for tractors which need to give only a very small output and therefore can be made exceptionally reliable. Attention had been called to the possibility of night plowing and doing work in shorter time during the season. Stone gave some figures showing how the daily horsepower hours of an average farm tractor varied during the season. It begins about April 1 with 100, reaches a maximum of 180 about April 15, comes down to 110 on May 10, to 60 on July 15 and keeps on declining, being nothing during the months from December to March, inclusive.

Attention was called to the large numbers of equipments sold for Ford cars. One of the speakers said he happened to know that one concern making only Ford equipments had placed orders for material for 50,000 sets last year. Shortage of labor on the farm was a factor that had to be reckoned with. In 50 per cent of the cases horses were driven by non-robust labor.

It was said that the reason the starter has not had a good show in the tractor field is that there has been no co-operation between starter engineers and tractor engineers. They all remembered the abortions that were put on automobiles in 1912 and 1913, and the conditions were about the same in the tractor field now. Above all, the engine must be designed for mounting the starter and generator, so that these

parts can be mounted rigidly. Another thing that will help to make the starter a success on the tractor is the enormous service organizations that have been built up by the large starter manufacturers and which extend into every part of the world. In nearly every part of the United States service can be rendered within a few hours.

Cost the Objection

T. B. Funk, Universal tractor, said that they had had some experience with starters. The objection to the starter was the cost. There was no trouble with the engine not starting in cold weather, as the starter would break it loose even if a man could not. They did not attach much importance to the starting itself, but it was his impression that if an electric system were fitted additional uses for the current might be worked out, as, for instance, for vaporizing kerosene. In one installation all wires were put inside ½-in. pipes. The battery was the crux of the whole situation.

Joseph Van Blerck said that in the marine field his firm had adopted the policy of not selling an engine without a starter, and he believed there was a place for the starter in the tractor field.

Professor Chase said that the modern farmer was quite resourceful and had his own ways of getting recalcitrant engines to run. One man hitched a team to his machine and hauled it down the road. Another, still more resourceful, hitched a steam tractor to a gas tractor and in that way got its engine to start.

The Battery Side

C. S. Whitney of the Willard Storage Battery Co. was called upon to state the battery man's side of the case. He explained how they had met with the same objections at first when it was suggested to fit electrical equipments to passenger cars. When that problem was solved came the truck problem. A special design of battery was evolved for the Liberty truck and was subjected to exceedingly severe tests on a vibrating board by Government engineers. It withstood the tests in a most satisfactory manner. A special suspension is also to be used for these batteries. The low charging rate required on a vehicle whose engine does not require frequent starts and runs at its governed speed all the time tends to increase the life of the battery. It is the continual overcharging that wears out the battery and that makes frequent addition of distilled water necessary. In this connection C. E. Wilson of the Westinghouse Co. emphasized the fact that the generator delivering the greatest amount of current to the battery is not necessarily the best. Current enough to keep up the charge is sufficient, and anything above this is a positive detriment.

Would Have Battery for Ignition

A speaker who said he was interested in the discussion as a service man asked the electrical experts present what happened to electric battery ignition when it was very cold. He had had a number of cases where the starter would turn the engine over, but no spark could be obtained. He verified this by using a separate battery and suggested that there should always be a separate battery for ignition. This was explained by the statement that when it is very cold not only is the engine stiff and hard to start, but the battery capacity is reduced, so the voltage across the terminals of the ignition coil drops when the starter switch is closed. At 10 deg. above zero the capacity of a battery is down about 50 per cent from normal. Gelzer of the Wagner Co. said that as long as the voltage or the coil was at least 2.8 they got a spark capable of igniting the charge. The suggestion of fitting a separate ignition battery was turned down. The drop in voltage produced by a certain current flow is, of course, dependent upon the size of the battery. If the battery is large enough there will always remain sufficient voltage to give a firing spark.

Must Give Service in Zero Weather

Greer pointed out that an electric equipment must be perfectly capable of giving service in zero weather or it is of no use to the farmer. In the northern part of the country and in Canada practically all of the plowing is done while there are night frosts, and threshing and other work in which tractors are used continues nearly all winter.

The latter part of the discussion centered around the relative ignition values of battery and magneto sparks. The magneto men claimed from 15 to 20 per cent more power from an engine than could be obtained with battery ignition, but the battery men would not concede this claim and pointed to the fact that the Liberty aircraft engine uses battery ignition, and that since De Palma's recent exploit with a Packard racer fitted with an aircraft engine all world's track records are held by battery ignition. There seemed to be a feeling among tractor engineers that where kerosene is used magneto ignition is preferable.

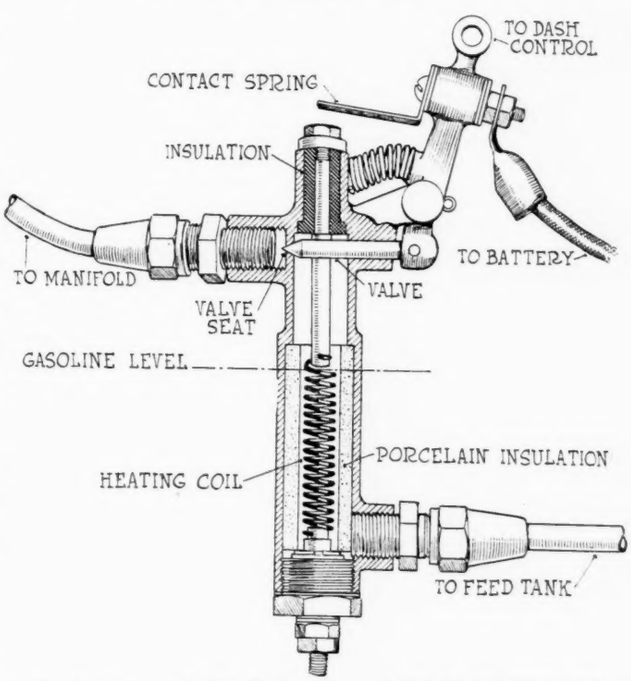
Primer with Electric Heater

THE Master Primer Co., Detroit, has purchased the primer invented by C. E. Summers, formerly of the Hudson service station at Hutchinson, Kan., and is placing this upon the market. The device has been adopted as standard equipment for the 1918 Franklin cars and other manufacturers are experimenting with it at the present time.

The device is of interest in that it both heats and atomizes the air, thus furnishing a preheated, vaporized mixture for starting in cold weather. Referring to the sectional illustration, it will be seen that it comprises a chamber in communication with the gasoline feed tank. Inside this chamber is a Nikrome wire coil which is directly contained in the gasoline well.

Surrounding the chamber in which the coil is contained, there is a porcelain insulation, and above the chamber there is an outlet which is controlled by a dash control. When the button on the dash is pulled it opens the valve at the outlet of the gasoline chamber and also establishes electrical contact with the coil. The coil immediately heats the gasoline, causing it to boil, and when the starter operates the engine the gasoline is drawn through the outlet which is above the throttle.

Since the throttle is closed when the primer is operated, all the suction of the engine falls upon the outlet, with the result that the gasoline is drawn through at high velocity in vaporized, preheated condition. The coil draws about 20 amperes and is claimed to start an engine on a cold morning in 6 or 7 seconds. The primer fits all cars that are equipped with a storage battery and sells for $12.50.



Section through the Master primer which preheats and vaporizes the fuel

The Sopwith Triplane

First Triplane in Service at the Front—Short Span, Excellent Range of Vision and Low Air Resistance Outstanding Features

A UNIQUE type among the various forms of aircraft in service at the front is the British Sopwith triplane. A description of this machine, with comment on its various features, appeared in a recent issue of the German *Airman's Journal*, of which the following is practically a verbatim translation:

Among the new airplanes which the war has created the Sopwith triplane holds a unique position, being the first machine of that type to be used for practical purposes. Triplanes had been neglected since the more or less unsuccessful experiments in the early years of aviation by Hans Grade in Germany (1911), by A. V. Roe in England and by Goupy in France, and not much of a future was predicted for them by any one. Since the Curtiss Aeroplane Works in the United States late last year for the first time again turned out a triplane, Sopwith, it seems, felt impelled to emulate their example.

The chief reason for the reversion to this type is undoubtedly the small span made possible by it. Perhaps Curtiss from the start proceeded in the right direction in that he made it almost wireless. Another advantage of the triplane resides in the relation of the chord to the span, as there is a triple span, owing to the addition of a third plane, though the proportion should never be less than 1:6; in most airplanes of very small span this ratio must be reduced. Thus in the Sopwith triplane the cord amounts to little over 1 meter for a span of 8 meters.

Single Struts Used

The increased head resistance of the planes is neutralized by the employment of single struts and simplified wiring. By employing the Curtiss strut construction, the wiring is confined to a single plane, as is evident from the side view. Owing to the reduced load on each plane, the main spars can be made rather light and still allow comparatively large free spans, those in the Sopwith triplane being about 2.75 meters with a free end of 1.40 meters. The aggregate weight of the planes should therefore be scarcely greater than that of biplanes of the same dimensions. It is possible that the arrangement of the planes affords the pilot a better view, as the middle plane lies in the level of the head, and the top and bottom planes cut off less of the range of view by their smaller chord than the normal planes of small biplanes.

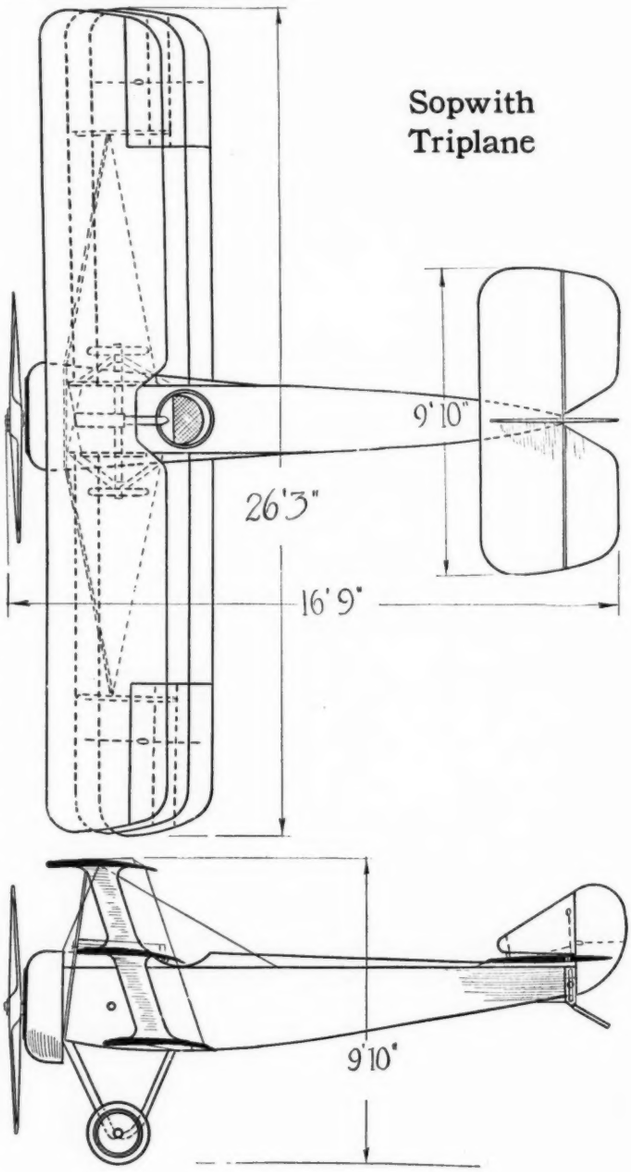
Sopwith puts a diagonal wire between the top and bottom strut junctions, which was not used by Curtiss. While the two strain wires pass in front of the middle plane, the landing wire is pulled through the latter. Forwardly inclined, diagonal wiring is arranged between the two inner struts, rising on the body sides, while the wires leading behind are not crossed. As is evident from the scale drawings, the planes are staggered about 25 per cent, with a gap of 0.9 meter, and carry ailerons, connected by vertical steel bands at their ends.

The triplane has a small dihedral and an angle of entry of 180 deg. The fuselage carries a 110 hp. Clerget rotary engine in front, surrounded by a round cowl, which overhangs the body so as to form an air outlet. The fuselage is of square section, which gradually merges into the round section of the engine housing forward by means of light, wooden ribs on both sides. It has a width of 0.7 meter and narrows down to a vertical edge at the rear to which the rudder is attached, with a fin in front.

The elevator is built in two parts and has a fixed tail plane, 3 meters wide, in front of it, the angle of which can be varied during flight, as in all Sopwith aircraft. The surface area of the Sopwith triplane is equal to 27 sq. meters and its weight, completely loaded, is about 670 kg., so that the load of the planes is only about 25 kg. per square meter. A high speed and a very good climb can no doubt be obtained by this small load. No exact performance data have been published.

The triplane is turned out both as a single seater and a two seater, and is always equipped with a fixed gun in front, lying on the body in the two seated model, with another rotatable one for the observer, whereby the weight, completely loaded, is increased by about 100 kg. As in all Sopwith airplanes, the landing gear consists of two steel knees and a divided wheel shaft, the links of which are secured to the body.

So far the Sopwith triplane has been used only sparingly and only about five or six are shot down each month. Whether it will be put in service at the front in large numbers will no doubt depend upon the account which these trial machines have given of themselves, concerning which nothing has been said as yet in the foreign press.



Organization—A Material Planning Department

System Successfully Installed by Hupp, Which Could Be Used to Advantage in Any Large Manufacturing Organization, Eliminates Much Waste of Money

By C. A. Marston
Industrial Engineer, Hupp Motor Car Corp.
and
J. Edward Schipper

MATERIAL for an automobile costs approximately ten to sixteen times as much as labor. Every company is familiar with the elaborate systems and devices which have been invented for the purpose of not allowing the labor cost to get beyond control and, in fact, for years the eyes of manufacturing men have been focused on cutting costs in the productive departments. Yet despite the fact that materials cost many times as much as labor, concern after concern has found itself in difficulty simply because enormous quantities of parts and materials have accumulated and must often be scrapped because they are not wanted.

This problem confronts every manufacturer. Why have companies which have changed models yearly and which have brought out new cars in rapid succession found themselves in great difficulties? It is not because of the cost of tooling up for the new job; it is not because of the necessary purchase of new machinery but it is often because the amount of material that is taken from manufacturing and put in service stock is so large that what would have been a good clean profit is hard hit by the enormous quantities of parts that have accumulated, much of which must be scrapped because they cannot be used as expected.

The Hupp organization presents a study in modern methods which brings to light a different side of the manufacturing business than is usually presented in a study of efficiency methods. The focal point of the organization is the general manager. Reporting to him are the manufacturing, purchasing, engineering, financial, and sales departments. The chart (Fig. 1) shows how these main departments are subdivided. We will concern ourselves only with the purchasing and manufacturing ends because it is here that a lack of attention may give rise to conditions which would soon become intolerable in manufacturing plants if they are not more fully realized. It is the link in the chain which should receive the same careful forging which marks the other links, and the one that is sometimes overlooked.

The general manager has reporting to him the manufacturing division, under which is the planning department. This is a direct part of the manufacturing department having charge of the inventory control, material-financial budget and monthly material releases. It has also charge of time study, piece prices and bonus rates. It is in this material group, such as inventory, financial budget for materials, and the monthly material releases that the novelty of this organization lies, and it is the system in operation in this department which has resulted in saving the Hupp Motor Car Corp. thousands of dollars in its necessary working capital.

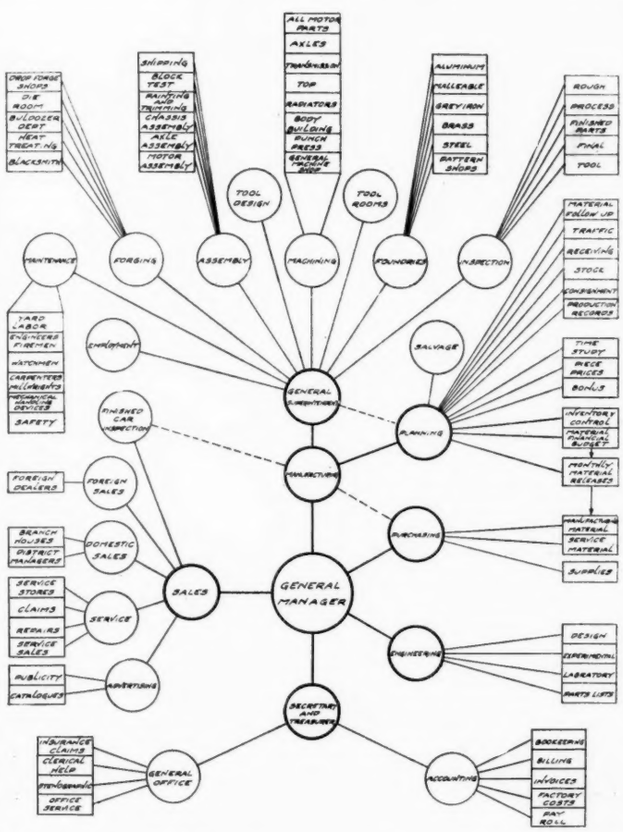


Fig. 1—Chart of Hupp organization, showing subdivision of main departments. The focal point is the general manager

Budget for General Manager

The general manager must know at least 30 days in advance how much money he must provide to meet the invoices for the current month's productive material, and when he receives from the head of the planning department the report of monthly releases, it tells him how much

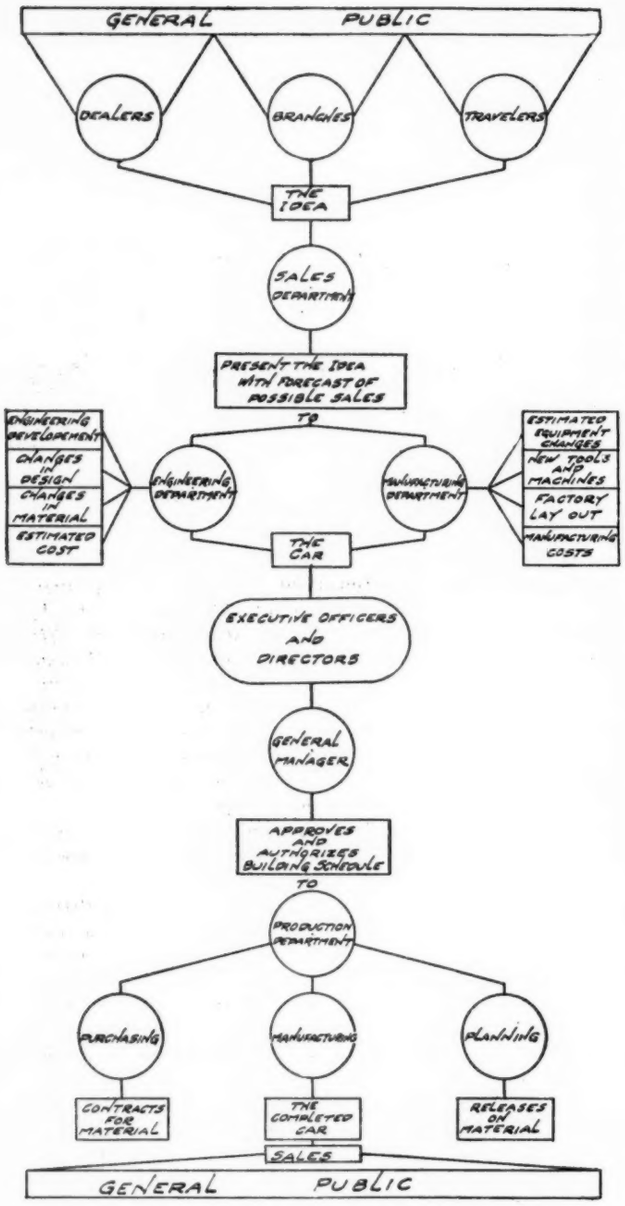


Fig. 2—The step-by-step progress of the planning of a new model, originating with the general public in the form of an idea germ and returning to them in the form of a finished car

money is required. This system permits the planning department head to give a prompt estimate which will be quite close to the total sum.

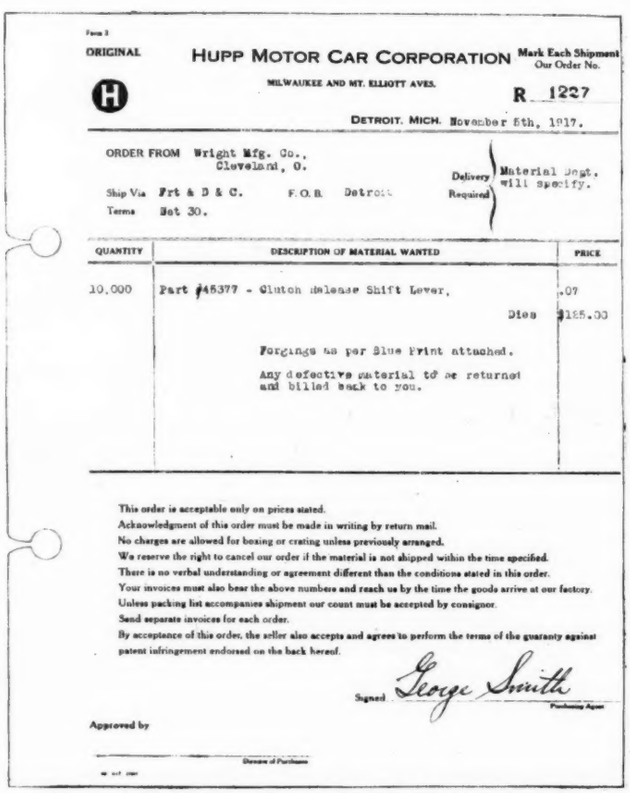
The ideal condition with a manufacturing schedule of 200 cars a day would be where each day just the number of pieces required to build the 200 cars are received, and a clean start made on each day's production. This would be the 100 per cent efficient plan, never reached in practice, but the goal of the system. As a result, the planning department gives the management its close financial budget estimate for the coming month's production; it controls receipts; it controls the quantities of material being delivered, thus preventing overshipment, it controls the quantities of materials to be carried on hand, and after all this is taken care of it watches production costs through time studies.

The entire program begins with the selection of the car to be built, as explained in Fig. 2. The general public is the primary step. Through the company's contact with the general public by its sales department, the germ of the idea for the completed car is transmitted from the prospective buyers to the organization. The company has three points of contact with the general public; through its dealers, its branches, and its travelers, and the germ of its idea for the car is transmitted through these three channels to the sales department, which presents this embryonic idea, together with a forecast of possible sales, to the engineering and manufacturing departments. These combine their practical knowledge with the idealized desires coming through the sales department, and together produce in concrete form the design for the new car itself. This is presented by the general manager to the executive officers and directors of the company, and, when their approval is secured, the general manager approves and authorizes a building schedule which is turned over to the production department.

From this point onward is where money-saving can result by a careful analysis of the manufacturing organization. The purchasing department contracts for the material, the planning department releases the material on the purchase orders that are issued, and the manufacturing department builds the car, turning it over to the sales department, which disposes of it.

Purchasing Department Orders

The purchasing department places the contracts for the materials. What really takes place is shown by the order blank, Fig. 3, and productive material progress chart, Fig. 4. The purchasing department contracts for materials for the first run, for say 10,000 cars that are to be built. It does not have anything to do with the amount of material that is to be shipped into the plant at any



Form 3

ORIGINAL

HUPP MOTOR CAR CORPORATION

MILWAUKEE AND MT. ELLIOTT AVES.

DETROIT, MICH.

Mark Each Shipment Our Order No.

R 1227

November 5th, 1917.

ORDER FROM Wright Mfg. Co., Cleveland, O.

Ship Via Frt & D & C. F.O.B. Detroit

Terms Net 30.

Delivery Required: Material Dept. will specify.

QUANTITY	DESCRIPTION OF MATERIAL WANTED	PRICE
10,000	Part #45377 - Clutch Release Shift Lever,	.07
	Dies	$185.00
	Forgings as per Blue Print attached.	
	Any defective material to be returned and billed back to you.	

This order is acceptable only on prices stated.
Acknowledgment of this order must be made in writing by return mail.
No charges are allowed for boxing or crating unless previously arranged.
We reserve the right to cancel our order if the material is not shipped within the time specified.
There is no verbal understanding or agreement different than the conditions stated in this order.
Your invoices must also bear the above numbers and reach us by the time the goods arrive at our factory.
Unless packing list accompanies shipment our count must be accepted by consignor.
Send separate invoices for each order.
By acceptance of this order, the seller also accepts and agrees to perform the terms of the guaranty against patent infringement endorsed on the back hereof.

Signed George Smith
Purchasing Agent

Approved by

Director of Purchases

Fig. 3—Purchasing order of the Hupp Motor Car Corp. Note the conditions printed below the description of the material

definite time. If the company from which it orders asks the time required for delivery, it tells them what the production expectations are, but this is not embodied in the contract. At the top right-hand corner of this order blank, Fig. 3, it states that the material department will specify when delivery is required; in other words, the planning department, which is the material department, will release the orders for this material as it is required.

The planning department takes care of the quantity of material that is to be shipped into the plant and thus sees that the inventory is kept balanced. In other words, it so supervises its releases that a condition cannot exist where there is material of one sort for 10,000 cars on hand and not enough of another sort for 500 cars. It does not permit a condition to arise whereby the factory ties up an investment in a large percentage of the various parts held inactive in the stockrooms awaiting the shipment of perhaps a few hundred dollars' worth of forgings and stampings.

Turning to the productive material chart, the entire course of this work can readily be followed. The general manager controls the building schedule and he authorizes the purchase of sufficient material to carry out the building schedule, plus a certain amount for service or repair requirements. He turns this over to the manufacturing department, which notifies both the purchasing agent and the head of the planning departments. The purchasing department is furnished blueprints and specifications by the engineer, after which time he consults with the production and service departments to know how much material to order and then contracts with the source of supply. The planning department arranges for the monthly releases of this material, takes care of the material follow-up and also of the traffic matters which must be handled in connection with the shipment and receipt thereof. The source of supply delivers the productive ma-

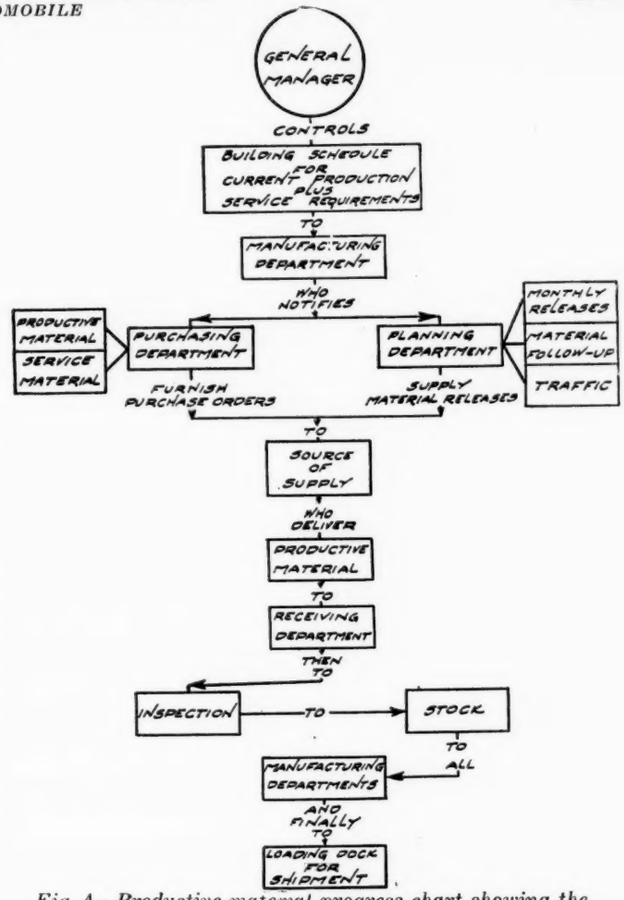


Fig. 4—Productive material progress chart showing the course of the order for material, telling the material placed in the finished car

HUPP MOTOR CAR CORP.

MATERIAL CONTROL RECORD

NAME OF PART	COST PER UNIT	QUANTITY REQUIRED PER EACH MODEL							QUANTITY FOR PROCESS	CLASS OF MATERIAL			PART NUMBER
SOURCE	2.06 Ea.	ALL	A.K.	MAG.	5 PASS	6 PASS	ROAD	SEDAN		R	S.F.	F.	
		1							500			V	42032

PURCHASE ORDER DELIVERY SCHEDULE

JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
REQD.	RECD.	REQD	RECD	REQD.	RECD.	REQD.	RECD.	REQD.	RECD.	REQD	RECD.	REQD.	RECD.	REQD.	RECD.	REQD.	RECD.	REQD.	RECD.	REQD.	RECD.	REQD.	RECD.
1000		1500		1500		1000		1000		1000		500		500						1000		1000	
2060"		3090"		3090"		2060"		2060"		2060"		1030"		1030"						2060"		2060"	

ORDER No.	QUANTITY ON ORDER	PURCHASE RELEASES 1916 DATE	QUANT.	TOTAL	SERVICE 1916 DATE	QUANT.	SERVICE DISBURSEMENTS 1917 DATE	QUANT.	TOTAL	RECEIPTS 1916 DATE	R.S. No.	QUANT.	TOTAL	RECEIPTS 1917 DATE	R.S. No.	QUANT.	TOTAL	DEFECTIVE 1917 DATE	SHIPP. No.	QUANT.	TOTAL	SCRAP 1917 DATE	QUANT.
8666	10000	NOV		1000	6-30	150	1-3		10	11-15	14107		250					4-7	46713		7	4-9	1
		DEC	1000	2000			3-15	25	35	11-17	14225	300	550	6-27	Bulk	Cotrol	9000	5-1	49812	10	17	5-17	3-44
13091	160	JAN	1000	3000			6-10	15	50	11-26	14530	200	750	7-7	10316	Bk. 7	9007	5-15	50918	3	20		
		FEB	1500	4500			7-15	10	60	11-29	14817	250	1000	7-9	10402	100	9107	5-31	60182	5	25		
		MCH	1500	6000			8-13	5	65	12-11	15028	500	1500	7-10	10451	275	9382						
		APR	1000	7000						12-25	15400	500	2000	7-10	10452	175	9557						
		MAY	1000	8000						1917 1-16	16117	750	2750	8-9	13027	Bk. 10	9567						
		JUNE	1000	9000						1-29	17281	250	3000	8-08	13214	150	9717						
		JULY	500	9500						2-10	17927	200	3200	8-27	13388	150	9867						
		AUG	500	10000						2-15	18101	200	3400	8-30	13618	75	9942						
			160	10160						2-19	18672	500	3900	9-4	21579	125	10017						
										2-24	19013	600	4500	9-5	21927	Bk. 8	10025						
										3-1	19117	100	4600			160	10185						
										3-5	19218	200	4800										
										3-10	19619	350	5150										
										3-17	20182	350	5500										
										3-28	26195	500	6000										
										4-6	26897	50	6050										
										4-9	27111	150	6200										
										4-11	27781	350	6550										
										4-24	28300	450	7000										
										5-11	564	100	7100										
										5-14	702	400	7600										
										5-15	721	200	7700										
										5-31	2823	300	8000										
										6-20	7117	75	8075										
										6-21	7246	75	8150										
										6-22	7350	450	8600										
										6-26	7493	150	8750										
										6-27	9256	250	9000										

Fig. 5—Material control record. This is the master chart recording the orders, releases, receipts, defective parts, scrap, costs, and the number required of all the materials entering into the car. Each one of these charts takes ..... of a part

HUPP MOTOR CAR CORP — MATERIAL CHECK UP RECORD

DATE 1917	PART NUMBER	NAME OF PART	WHERE USED AND QUANTITY	QUANTITY REQUIRED TO FINISH RUN	QUANTITY REQUIRED FOR SERVICE	TOTAL	QUANTITY IN STOCK	QUANTITY IN PROCESS	QUANTITY ON CONSIGNMENT	BALANCE DUE ON ORDER	TOTAL	QUANTITY TO CANCEL	QUANTITY TO ORDER
7-12	40091	Stand Pipe	2 all	2722	0	2722	924	396	—	0	1320	—	1402
	40062	Valve	8 all	18888	1700	20588	3636	2784	—	13606	20026	—	562
	42891	Rod & Cap	4 "	9232	1000	10232	1600	1564	1279	3000 Hup 971 Hup	8414	1818	—
	42103	Stop lever	1 L.H.2.	2891	400	3291	1712	593	861	0	3166	—	125
	41607	Clamp. Inc. bolt & nut	1 all	2256	50	2306	1130	442	—	0	1572	—	734
	15280	Gasket	4 2nd Series	944	150	1094	839	110	—	0	949	—	145
	40408	Support Cleat	1 all	1627	400	2027	944	562	—	0	1506	—	521
7-13	41016	Rt. Spring R	2 Road.	250	160	410	198	201	—	0	399	—	11
	40263	" " 5	2 - all E.P.	3152	2000	5152	1215	702	—	560-L 2425-M	4902	—	250
	41027	" " 5	2 - all Sed.	60	50	110	83	55	—	0	138	28	SERVICE will use
	40923	" " 6	2 all C.P.	324	158	482	266	231	—	0	497	15	

Fig. 6—Material check-up record which tells the amount necessary to order to fill production requirements

terial to the company's receiving department, which checks the amounts and turns it over to the inspection department, whence it passes to the stockroom.

After the general manager releases the building schedule and the purchasing agent orders the material to take care of that entire schedule, the material control passes into the hands of the planning department, and the planning department is responsible for getting the material into the plant in time to meet the production schedule and yet not in quantities which would result in an unbalanced condition of the inventory.

Material Control Record

With the Hupp system the material control record is the master key to the entire material situation. This is the record of the chief of planning and from it he not only keeps accurate tab on what is coming in, what should come in, what is defective and what is being used in service repairs; but he also knows from it the figures which go to make up the budget for the coming month's production. The material control record, Fig. 5, is practically self-explanatory. In the upper right-hand corner is the part number 42,032. One is required for all models at a cost of $2.06 each. The building schedule is 1000 for November, 1000 for December, etc., the cost for the month on that material being $2,060. This gives the financial budget of productive material, because it is only necessary to add these figures from all of the similar records for other parts to secure the total cash required. One of these sheets is made out for each part number.

According to this material control record in the last column, material order No. 8606 calls for the 10,000 parts necessary to fill the building schedule. The planning department releases are given against this order number, and, as will be seen, each month—November, December and January—1000 were released. Under date of June 30, service department orders 150, and under the next column of "service disbursements" the quantity released through the service department is scheduled.

The receipts of the material are also noted, together with the date and quantity and the number returned defective, posted in the next column, scrap being in the next. It will be seen that at the completion of the order, 10,185 of the parts were received. This is due to the fact that an additional quantity was ordered because of service, less tweny-five which were sent back defective and returned, and four which were scrapped, and an allowance of six more to be scrapped at the same rate. This material control record gives a complete master chart of everything coming into the factory and going out. It only requires two men to handle all of these charts for the entire production, and it is from this master chart that the material situation is controlled.

The material check-up record shown in Fig. 6 affords a continual check on the productive material and takes the place of a perpetual inventory. The form is practically self-explanatory from the study of the headings. The part number and name of part is given and the number used in each car, or in each type of car, is shown in the following column. The quantity required to finish the run of cars is given, and this, together with the quantity required for service repairs, goes to make up the total which must come in to complete the order. Against this quantity is charged the number of parts in stock, the number in process, the number on consignment, and the balance due on order. This gives a total of incoming material, showing the amount necessary to complete the order.

It is this check-up record which prevents overloading the plant with material. The planning purchase order release record (Fig. 7) is made up from the building schedule.

(To be continued)

HUPP MOTOR CAR CORP. — PURCHASE ORDER RELEASE RECORD.

SOURCE OF SUPPLY	ORDER NUMBER	PART NUMBER	Oct QUANT.	Nov QUANT.	Dec QUANT.	Jan QUANT.	SOURCE OF SUPPLY	ORDER NUMBER	PART NUMBER	Oct QUANT.	Nov QUANT.	Dec QUANT.	Jan QUANT.
B C Co	623	45234	1000	1200	1800	2000	S. P. Co	189	45310	2000	2400	3600	4000
W. M Co	302	45236	1000	1200	1800	2000	S. M. S. Co	26	45314	1000	1200	1800	2000
C. S. Co	605	45238	1000	1200	1800	2000	N. S. Co	119	45320	1000	1200	1800	2000
K. M. Co	451	45240	1000	1200	1800	2000	S. P Co	215	45329	2000	2400	3600	4000
S. S Co	36	45242	500	600	900	1000	B. M. Co	98	45330	1000	1200	1800	2000
V. A. Co	208	45242	500	600	900	1000	A. S. Co	535	45331	3000	3600	5400	6000
S. S. Co	39	45245	500	600	900	1000	A. S. Co	128	45333	1000	1200	1800	2000
V. A. Co	210	45245	500	600	900	1000	D. R. Co	626	45343	2000	2400	3600	4000
T. K. M. Co	852	45246	1000	1200	1800	2000	B. R. Co	544	45349	1000	1200	1800	2000
B. B. Co	354	45253	1000	1200	1800	2000	B R Co	545	45350	1000	1200	1800	2000

Fig. 7—Purchasing order release record authorizing the material department to release against specifications

Specifications for Assembly of U. S. Quartermaster Corps Trucks

WASHINGTON, D. C., Dec. 6—The Military Truck Production Board in conjunction with letting of assembly contracts for the B trucks has issued the following specifications to winners of the contracts:

1. DESIGN. All trucks and parts thereof furnished under these specifications shall be manufactured to drawings and parts lists furnished by the Military Truck Production Board, Q. M. C.

2. MATERIAL. All material must be as specified on the drawings unless special permission for substitution has been granted by the Supervisor of Inspection, M. T. P. S.

3. In no instance will permission be granted for substitution of an inferior grade of material unless authorized by a change of the drawing.

4. Wherever it is impossible to define the quality or properties of material on the drawing or in specifications the purveyor shall submit samples for the approval of the Supervisor of Inspection.

5. Not only must all materials conform to the drawings in respect to chemical analysis and physical properties but must be of uniform quality and free from defect.

6. FORGINGS. All forgings shall be free from injurious imperfections such as excessive die shifts, scale, fins, cold shuts, pock mark, etc. Forgings shall not be painted before inspection by Government Inspector.

7. CASTINGS. All castings shall be free from injurious defects such as excessive core or flask shifts, sand holes, blow holes, fins, chill cracks, etc. Core holes shall be thoroughly cleansed of sand, chips, nails, etc. Castings shall not be painted before inspection by Government Inspector.

8. STAMPINGS. All stamping and pressed steel parts must be free from corner cracks, splits, brittle spots, etc. Stampings shall not be painted before inspection by Government Inspector.

9. WORKMANSHIP. All workmanship must be strictly first-class, all machining, heat treating, assembling, painting, etc., to be done thoroughly.

10. MACHINING. All machining must be to limits specified on drawings. It is not intended to hold unnecessarily close limits but in no instance will permission be granted for a departure that would destroy interchangeability.

11. The finish must be as specified on the drawing.

12. All threads must fit without shake. All threads must be cut according to tolerance and limits specified by Supervisor of Inspection. Not more than three threads shall protrude after nut is tightened down to final seat.

13. All corners which are exposed shall be broken.

14. No welding shall be done after machining. No welding shall be done on highly stressed parts where strength is liable to be impaired thereby.

15. Soldering of aluminum parts permitted after machining if strength will not be impaired thereby.

16. HEAT TREATMENT. All heat treatment to be thoroughly done and checked by frequent tests.

17. Samples of each heat to be tested to ascertain if required properties are being obtained.

18. Heat treating furnaces should maintain an even temperature.

19. The pyrometer equipment should be frequently calibrated.

20. ASSEMBLING. All assembly must be carefully done.

21. No careless or makeshift work will be permitted.

22. All parts must be cleansed of dirt and chips before being assembled.

23. All nuts must be drawn tight without stretching bolt or injuring thread.

24. All cap screws must be drawn tight without stretching or injuring thread.

25. All cotter pins must be in place and properly spread.

26. All lock wires and lock washers must be in place.

27. Where hot riveting is specified it must be done at proper heat and heads must be perfectly formed.

28. TESTS. The purveyor will be called upon to make such tests of finished product as may be necessary to insure free operation and proper performance of function for which part is intended.

29. The purveyor will be called upon to make such physical and chemical tests as will insure adherence to requirements of drawings and proper performance of function of the part.

30. INSPECTION. The production of the Standardized Military Trucks for the U. S. Government and all parts thereof shall be open to inspection by officers of the U. S. Army assigned to purveyor's plant for that purpose.

31. Such officers shall have free access at all times to all parts of the purveyor's works in which any work is under way in connection with any parts furnished under these specifications. Such parts in detail and under such process of manufacture shall be subject at all times to approval of inspectors.

32. Communications between purveyor and department shall pass through hands of inspector stationed at purveyor's plant.

33. Purveyor must provide suitable quarters with necessary desks and equipment for inspectors and stenographic aid if found necessary.

34. Purveyor will give access to all gages, tools, and testing machines necessary to the proper inspection work.

35. All necessary working gages, templets, etc., to be furnished by purveyor.

36. Purveyor will furnish Chief Inspector a list of sub-purveyors together with quantity of material ordered from each.

37. Inspector shall have access to all work in process in sub-purveyor plants.

38. Purveyor will furnish inspector reports of all tests that purveyor or sub-purveyor may make on material or parts entering into trucks.

39. Purveyor's employees will not interfere with progress of inspection but must co-operate with inspector in every possible way.

40. All parts will be inspected without unnecessary delay and if found to be in all respects as required by specifications shall be received and become property of the United States.

41. Any parts not conforming to specification requirements in material or workmanship may be rejected by inspector at any stage of process of manufacture.

42. Inspector may upon verbal notice suspend work on any part if in his estimation purveyor is not complying with specifications. Inspector will at once communicate with his superior and obtain quick decision on matter.

43. Contractor shall not continue production of parts in question except at his own risk without approval and consent of inspector. Inspector will not give approval and consent until satisfied that purveyor does and will continue to comply with specifications.

44. Purveyors will equip themselves with such working and inspection gages as are necessary. Gages will be checked either by Bureau of Standards or by inspector with standard gages furnished by Inspection Department, at discretion of the Inspector.

45. The purveyor will notify the inspector at his plant when such tests as inspector desires are to take place. This notice shall be given in advance that inspector may personally witness such tests. Purveyor will make systematic report as to progress of all work in his plant which concerns inspector.

46. Purveyor will provide necessary labor or materials in connection with inspection such as crating or uncrating of gages, instruments, etc.

47. Purveyor must have Government inspector pass on no less than 10 per cent of finished parts or units before proceeding into the next operation.

48. MARKING. Purveyors shall mark visibly such parts as inspector shall designate with identification mark assigned by Supervisor of Inspection as well as with the part numbers of the piece.

Trundaar Tractor of the Creeper Type

Tread Built on Log-Chain Principle—Individual Tread Clutches Do Away with the Usual Steering Gear and Differential—Deppé Integrator Permits the Use of Low Grade Fuel

AFTER years of experimentation with farm tractors, the Buckeye Mfg. Co., Anderson, Ind., has placed upon the market the Trundaar tractor, which is now in quantity production. The Trundaar is a creeper tractor built to perform all kinds of farm work from plowing to threshing. It is a four-plow machine, capable of developing 20 hp. at the drawbar and 35 hp. at the belt.

This tractor takes its name from its patented tread, which is of the endless belt type, built on the log-chain principle and differing from most treads of this type on the market in that it requires no lubrication. While designed with a view to minimizing wear, in order to facilitate replacements, every link of the chains and every grouser plate is made quickly detachable.

To reduce fuel cost the Buckeye company has acquired exclusive rights in the tractor field to the Deppé Integrator, which has been known to automotive engineers for several years as the Deppé vaporizer. A four-cylinder 4¾ by 6¾-in. Buckeye-Waukesha tractor engine is used. All vital parts of the tractor are protected from dust, and an air cleaner is fitted to the intake of the Deppé vaporizer. To relieve strains on the power plant and on the treads a double three-point suspension is used. Power is applied to the treads by individual multiple disk clutches. Two speeds forward and a reverse are provided by the large spur gear transmission. Other notable features are a quickly adjustable power pulley and a spring-suspended driver's seat.

The Trundaar tread comprises a series of grouser plates carried on two parallel chains. A master link of each chain is bolted to each grouser plate, the connecting links between adjacent grouser plates providing the necessary flexibility. These connecting links are made short to minimize movement and consequent wear as the chains travel round the tread wheels. Steel blocks carried on the grouser plate bolts strengthen the master links and hold the short links in place. A master lug bolted to the center of each grouser plate takes the drive from hardened steel rollers mounted in the tread drivers. The load is evenly distributed and wear is minimized, due to the fact that nine of these lugs and rollers are constantly in contact. For ground that is unusually soft, or for other reasons does not afford proper traction, quick detachable mud grousers are provided at a slight extra cost. These may be fitted to the tread in a few moments.

There are two wheels for each tread, the rear one being the tread driver and the front one acting as an idler. The tread drivers are 36 in. in diameter and transmit the power through the rollers and master lugs on the grouser plates. The individual multiple disk clutches controlling the tread drivers are incorporated within them. Both tread drivers are carried on the rear axle. Owing to the use of individual clutches for the two drivers no differential gear is required.

Each front tread wheel is mounted on a short shaft carried in 10-in. slots in the side of the steel tread truck frame. Heavy bolt adjustments are provided for taking up slack in the tread. These front wheels are of 30-in. diameter and are built with a double rim to provide free passage for the master lugs in the grouser plates as the treads pass over them.

The length of the tread on the ground is 6 ft. To insure positive alignment, a series of double trolley wheels travels between the tread wheels. One set runs on the grouser plates outside the chains, and there are two pairs of these trolley wheels between the two chains, and straddling the driving lugs. The same construction is used on each tread and renders it impossible for the tread to be thrown off the tread wheels, or even to twist sidewise. The tread is 15 in. wide, so its area on the ground is 2160 sq. in., insuring positive traction. An apron of armor steel ⅜ in. thick protects the entire tread truck assembly, comprising tread wheels, trolley wheels and the tread chains on the ground.

A large tool box is conveniently mounted on the tread truck frame between the tread wheels at each side. The tread truck frames are connected at the front by a heavy tie-bar and at the rear by a strong cross-plate mounted in conjunction with the arc-shaped drawbar. The main frame and power plant form one unit and the tread assembly another, both of these units having a three-point support.

Front Axle Pivoted at Center of Main Frame

In the main frame unit the front axle is pivoted at the center of the main frame and plate, each end resting on a powerful coil spring mounted on the tread truck frames.

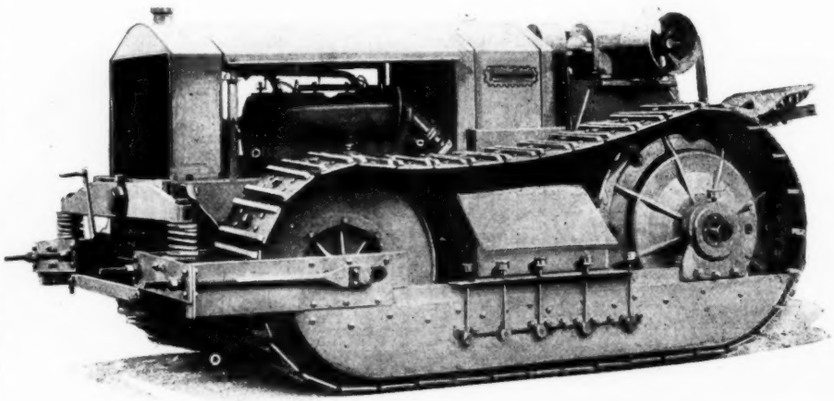
The heavy structural steel main frame carries the radiator, engine and flywheel, engine hood, 30-gal. fuel tank, and, on a cross-bar in the rear, the driver's seat, control levers and pedal assembly.

In the tread unit of the double three-point system the triangle is reversed, since the tread truck frames form the two points and the apex is at the rear.

A four-cylinder 4¾ by 6¾-in. Buckeye-Waukesha engine is used in the Trundaar. This is specially designed for the severe conditions and constant heavy loads of tractor service and develops 52 brake hp. The crankshaft is of 2 in. diameter and the valves are 2⅛ in. in the clear. A governor is inclosed in the engine.

Ignition is by a Kingston high-tension magneto, with impulse starter. Lubrication is by constant level splash, with surplus oil reservoir and circulating pump. Cooling is by pump and fan, the large capacity radiator being designed for tractor work.

Besides reducing fuel cost, experimental work with the Trundaar tractor fitted with the Buckeye-Deppé Integrator



The Trundaar Tractor

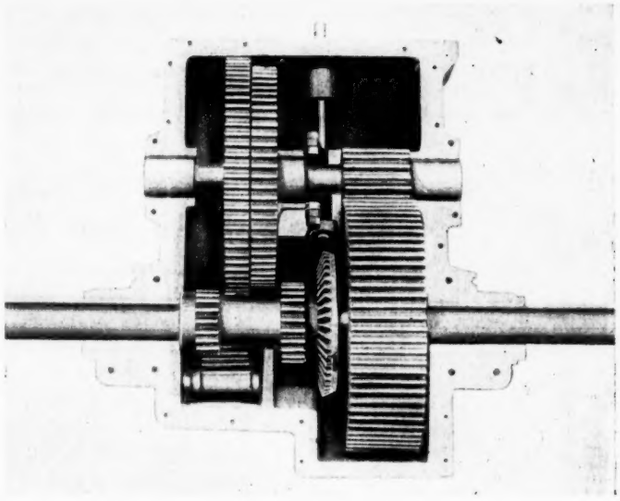
has shown, it is stated by the manufacturers, that this system prevents overheating of the engine, dilution of the lubricating oil and deposition of carbon, and that it minimizes spark plug trouble.

The main clutch, which delivers power from the engine to the transmission, is a multiple disk construction, running in oil.

One of the most interesting features of the Trundaar tractor is the design of the independent multiple disk clutch controlling each tread driver. It comprises the outside and inside halves of the tread driver, a driving wedge, two driving rings and two driven rings. Both clutches run in oil. Pulling the lever controlling either clutch withdraws the wedge ring from contact with the beveled driven rings by releasing the tension exerted by a powerful compression spring. When the wedge ring is disengaged in this manner it stops the tread and driver on which it operates. On releasing the clutch lever the compression spring forces the wedge ring back into driving contact. These individual clutches with their control take the place of the usual steering gear. Disengaging one clutch stops its tread and the tractor will turn completely around in a 30-ft. circle. To facilitate this operation and to render control positive a drum in each drive clutch housing carries an expanding brake of 24 in. diameter, lined with thermoid.

A 20 per cent margin of safety is provided in every part of the two-speed-and-reverse transmission. It is a spur gear design, mounted on the rear axle, which is a solid 3-in. shaft. The bevel gear and two primary reduction gears operate as a sleeve unit on the axle shaft, to which the main driving gear is keyed. The two secondary reduction gears and main driving gear pinion are mounted on the countershaft, which is 2½ in. diameter. A cam under the axle shaft carries the reverse idler pinion. A lever on a quadrant on the transmission case operates the shifter fork mechanism. The main driving gear and pinion have 5½-in. faces and the reduction gears 2-in. faces.

On the transmission case is mounted the gearcase of the power pulley which operates directly over the left tread driver. This unit is driven by inclosed chain and sprockets from the main driveshaft. The pulley is 10 in. in diameter and has an 8-in. face. The belt may be applied from either front or rear, and the necessary adjustment and belt tension may be secured very quickly without losing time in maneuvering.

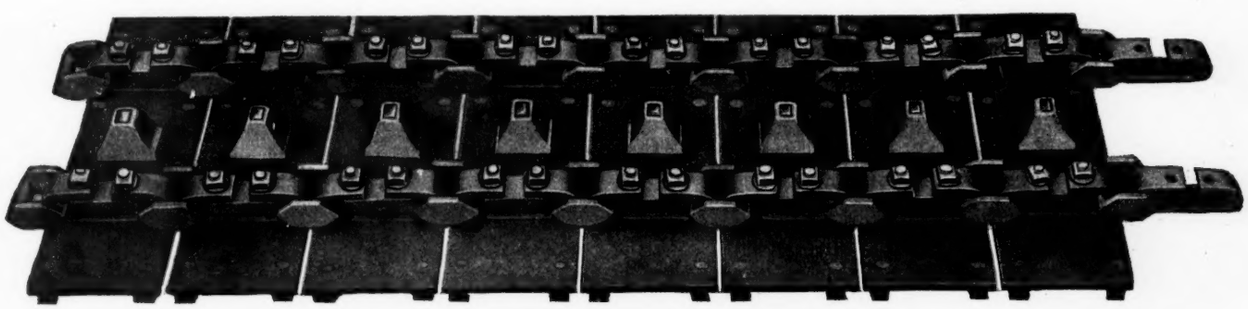


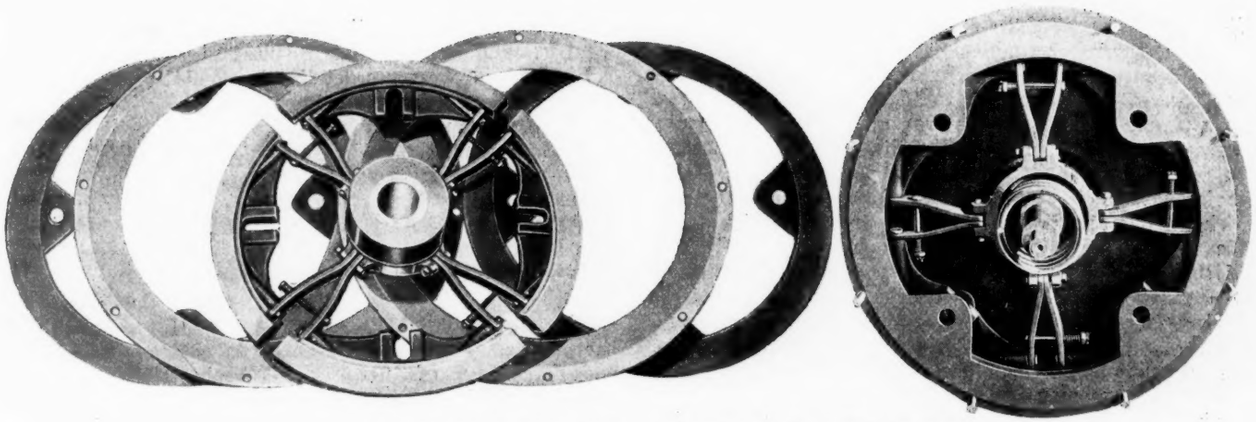
Trundaar tractor transmission

Roller bearings are used for the countershaft of the transmission and outside main bearings on the tread drivers. Ball thrust bearings are used wherever end thrust and side stress occur. All bearings without internal lubrication are provided with grease cups.

All control levers and pedals are within easy reach of the operator, whose comfort is further increased by the spring-suspended seat—an indication of how tractor engineering is profiting by automobile practice.

The tractor is 6 ft. 2 in. long overall and 4 ft. 10 in. in height. The weight is 9500 lb. and the turning circle 12 ft. The Trundaar sells for $2,950.





Above is shown section of tread; below, detail of tread drive clutches

Critical Point in Labor Turnover*

20 Per Cent Turnover Marks Danger Point—Large Turnover Equivalent to Continuous Strike—Many Causes for Large Changes Mostly Curable—How to Study Turnover Records

By Richard B. Gregg

EDITOR'S NOTE—When labor turnover in a plant exceeds 20 per cent per year it is time the employer took steps to find out the cause and effect a cure. This is the salient point of the valuable analysis of the subject which follows. A plant where the turnover is below 20 per cent should usually be in a stable and safe condition, because there is some turnover which is unavoidable—natural death, sickness, domestic happenings, marriage and so forth. The author of the paper also shows that excessive turnover must have a cause and that a scientific study will enable it to be removed.

In the discussion of the paper, which was very full, there was one idea which stood out strongly, and this is that a worker should receive reward for long service. That a worker who stuck to his or her job should be paid for doing so in some way, just as a manager or executive expects to be. It transpired that in the textile trade, which was the one being especially considered, some manufacturers have adopted the system of making an annual payment to employees of over a year or over two years' service. Others espoused the plan of providing free life insurance for employees, increasing the amount as the length of service increases. The idea is strongly held that the long service reward should be kept recognizable as such by making it something distinct from wages. A wage increase is not the same thing in effect, though it may be in fact. The paper follows:

> *"WHAT can be measured can be controlled." When labor turnover can be measured, analysis soon shows the cause for it, and the cause discovered, the cure is in sight. National prosperity depends upon the citizen's contentment with his life and work.*

As a way of obtaining truth the scientific method is capable of expansion to many regions of human activity hitherto explored only very superficially. One problem which has recently been illuminated by the application of this method is that large group of difficulties known as the labor problem—perhaps the most perplexing, complex, insistent and far-reaching problem we are now facing. It has affected and will continue to affect more people even than this war and will outlast it by many generations. This paper discusses one aspect of the problem which, although only a small corner of the whole question, is even by itself of great importance.

The particular part of the labor problem which scientific method has recently done much to clarify is that shifting of workers from one place of employment to another, known as labor turnover. Some refer to it as "hiring and firing." The subject has been written and talked about considerably in the last two or three years, and no doubt is very familiar to most people. The time has come now when we can profitably examine its scientific aspect in order better to realize its implications and extend its usefulness.

The study of labor turnover is the measurement of the movement of industrial workers in and out of their employment, and the analysis of its causes and results. The value of such study is patent to every one who has ever handled employment. The difficulty of training a continually shifting force, the low quality and quantity of production obtainable from tramp workers, the lack of team play, low standards, poor tone, discontent and unrest in an establishment where the labor turnover is high—all these are factors that gravely affect both the annual balance sheet and the ease and effectiveness of management.

There is, of course, a certain amount of labor turnover which is unavoidable and normal. A factory will always be losing employees from old age, death not caused by industrial accident or occupational disease, marriage, changes of residence or domestic events wholly uninfluenced by the character of work or pay. What this normal amount will be will vary from factory to factory according to local conditions. A careful estimate in one instance placed it at 21 per cent of the total working force. The amount of turnover in excess of this normal, excepting lay-offs due to slackening demand for product, may be considered a kind of barometer of dissatisfaction, either of employer with employee or of employee with position. The quittings are in effect a sort of gradual continuous strike. These things demand careful thought.

Let us imagine a factory where there is a high labor turnover, with all its consequent difficulties. What would it mean to apply scientific methods to this problem, and what would be the probable results?

First of all, we must get the facts. How great is the labor turnover? To get this we must examine the payroll or keep a record of the hirings and quittings and discharges from the entire factory for a given period of time—say a year. By comparing the total number of leavers for all reasons with the total normal number of workers in the factory we may obtain the turnover in terms of percentage, which is useful for comparisons with other periods or other groups of workers. In getting the percentage for a smaller group, the basis will be the normal number in that group. For purposes of thorough analysis it will be well to obtain the amount and percentage of turnover for each department and each job within the departments. In one factory the annual turnover for the entire concern for several successive years was in the region of 45 per cent. Again, in

*Paper read before the American Society of Mechanical Engineers, Dec. 6, 1917, at the annual convention in New York City.

one department in a certain cotton mill the turnover last year was over 500 per cent. The turnover on some positions will occasionally run much higher than that. These figures, after making allowances for lay-offs and normal turnover, point to economic defects and begin to clarify our problem.

Having obtained the annual turnover *in toto* and in detail in this fashion, we will get further light on the situation by working out the turnover for each week and for other divisions of the year, such as each of the thirteen four-week periods. In this way we learn whether there are any seasonal or periodic fluctuations. In some industries, such as the building trades or the manufacture of clothing, such variations are very marked.

It is obvious that these measurements and analyses tend to make it more possible to learn the causes for the turnover. Once we learn real causes and definitely locate responsibilities, we are in a position to begin to control the phenomenon.

Wage Factor as Cause for Leaving

Carrying out our analysis and arrangement of facts still further, we can often obtain very valuable indices of the reasons for high labor turnover. For instance, grouping the leavers according to their actual earnings will show the significance of the wage factor as a cause for leaving. To illustrate how this works out: A certain cotton mill learned that there was a high labor turnover in its power department. Upon further analysis the turnover was found to be confined almost entirely to the coal handlers. Inquiry showed that these men were receiving fifty cents a week less than the coal handlers at the local railroad station. The wage was raised fifty cents, the turnover ceased, and the management was relieved of its worry about demurrage charges. Usually a large part of the shifting will be found in the low-paid groups. The result of most experiments with this fact seem to show that low wages are much more the cause of the high turnover than any inherent and unchangeable characteristics of that group of workers.

Other groupings which might prove significant are sex, nationality, age, foremen, rooms, heaviness of work, amount of illumination or ventilation of work place, dirtiness of job, method of pay, amount of accident risk, anxiety, amount of other fatigue factors, distance of workers' homes from the factory, etc.

Interviewing Those Who Leave

A further aid in learning the causes for leaving is making inquiries from the foremen and from the leavers before they go. Not too much reliance can be placed on this information, however, as it is very apt to be distorted or wholly falsified by anger, fear, prejudice and all sorts of personal motives.

As a result of all this recording of facts, measuring, weighing, testing, analysis and classification, we find ourselves able to determine the real causes for the turnover in a large number of cases. Sometimes the causes will be simple, as in the case of a motor company which learned that most of its leavers resided a considerable distance away from the plant. By giving preference to applicants living near by the turnover was gradually reduced very greatly. Usually, however, there is a complex set of causes. Often the apparent cause merely serves to release discontent that has gradually been accumulating for a number of reasons. With patience and skill we can usually arrive near the truth.

By further measurement and analysis we can determine, or at least approximate, the cost of losing a worker in a particular position and training another. These costs may be roughly divided into overhead costs and operating costs.

Among the overhead costs there are:

1. More rapid depreciation of machinery because of ignorance or lack of skill of new workers.

2. Extra floor space and extra machines to provide against idleness of a certain amount of machinery due to shifting labor.

Operating costs may include any or all of the following:

1. Time of increased superintendence or office work, including:

(a) Time spent by foreman or superintendent in discharging a worker where that is the way the vacancy occurred.

(b) Time spent by foreman or other workers in training the new employee.

(c) Time spent by clerks on additional payroll or other records.

2. Machine costs, covering:

(a) Time machinery is idle when a new worker cannot be obtained immediately.

(b) Idle machinery for temporary stoppages due to ignorance or lack of skill of new worker.

(c) Repairs to machines or renewals of tools broken for the same reason.

3. Material costs, including:

(a) Waste or damaged material due to ignorance or lack of skill of new worker.

(b) Difficulties in subsequent processes due to poor work by new employees in previous processes.

(c) Lower production while new employee is working up to his best skill.

4. Additional accident cost due to higher rate of accidents among new employees.

Costs $10 to Replace Ordinary Laborer

These two kinds of overhead costs and four groups of operating costs, while not exhaustive, serve to illustrate the method of observation, recording, measurement and analysis which is just as helpful in this aspect of the matter as elsewhere. With knowledge so obtained the factory manager is in a position to estimate more truly the importance of this problem and to judge whether he can afford to take certain steps to reduce the turnover.

As is probably well known, those who have made the most careful studies of this question find that it costs about $10 to replace an ordinary laborer, and as much as $300, and perhaps more, to replace skilled workers. The cost varies of course with the nature of the position. The total losses are, of course, enormous. Magnus Alexander, Mem. Am. Soc. M. E., in his well-known study, estimated the losses in a group of twelve metal working factories in a single year at not less than $831,000. The annual loss from high labor turnover in a particular textile mill employing about two thousand workers is estimated as at least $20,000. These instances could be multiplied.

It should be remembered, moreover, that none of these estimates include the losses to the employees or the community. What frequent job shifting means to the employee and his family in terms of frequent house moving, ill-feeling, discouragement, bitterness, decrease of skill, lowering of pride and self-respect, we have no means of measuring. What it means to the community and nation in terms of underemployment and unemployment, increased pauperism and drinking, inefficiency and social friction, we cannot even estimate.

Everywhere we go we can find the reasons for the labor turnover indicated clearly enough to point out sound

(*Continued on page 1057*)

Akimoff's New Balancing Machine

Owing to Difficulty of Obtaining an Accurate Static Balance on Parallel Ways, This Machine Is Designed to Indicate Both Static and Dynamic Unbalance in Separate Tests

IN a paper read before the American Society of Mechanical Engineers, on Recent Developments in Balancing Apparatus, N. W. Akimoff, inventor of the dynamic balancing machine bearing his name, emphasizes the need of a previous accurate static balance of the part if the dynamic balancing machine is to give satisfactory results. It is often difficult to secure a sufficiently accurate balance by the usual method, by means of balancing ways. In balancing on parallel ways there is a limit to the load which can be safely borne by the journals in contact with the ways. A safe load for the journals appears to be 750 lb. per inch width per inch diameter of journal.

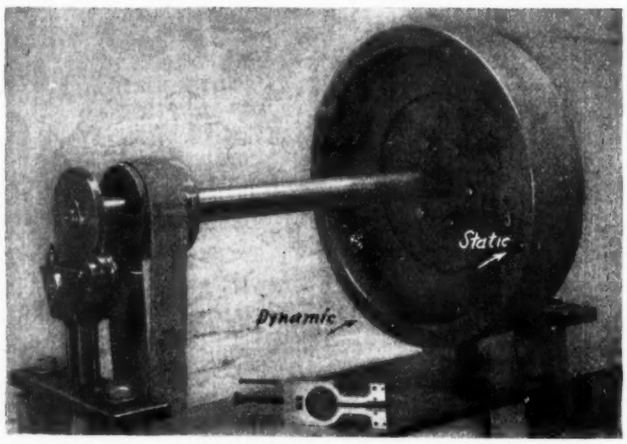


Fig. 1—Unbalanced body, with center of gravity lying in its axis

In order to register the effect of static unbalance of a body, or the correction introduced by means of such a clamp as described, the body must be placed in such a condition that its oscillations are emphasized or magnified to an extent that will be visible to the eye; otherwise its unbalance, even if considerable, will not be noticeable and will only result in increased pressure on the bearings. Thus, in a badly unbalanced automobile engine, it is most often possible to pick out a range of speeds where the engine will appear to work smoothly; and many an electric motor with badly unbalanced rotor will apparently run well, simply because its speed may be far away from that which would insure synchronism of the rotation with the oscillation of bearing supports.

Now, suppose we have a frame, suspended as shown in Fig. 4, and capable of a certain period of swinging oscillation. If the body, statically unbalanced, is operated at a speed corresponding to the period of oscillation, the oscillations will become violent and can be very readily registered by any suitable dial gage indicator. Here the body is imposing its own period on the frame, which thus performs what are known as forced vibrations of the same period.

As regards dynamic unbalance, due, in a statically balanced body, only to the presence of a centrifugal couple, the following remarks can be made: In the first place, the "theory" that this centrifugal couple is due to the fact that the centers of gravity of both halves of the body, cut through its center of gravity, do not lie on the axis of rotation, is radically wrong. Take, for instance, a skeleton body shown in Fig. 1. Its center of gravity is exactly on the axis of rotation, as also are the individual centers of gravity of each half, to the right and to the left from A to B. Yet such a body would be manifestly out of balance (dynamically). Inversely, a body would readily be imagined to be both in static and dynamic balance, although each of its halves were statically out of balance. The only correct way to characterize dynamic balance is to say that the products of inertia, referred to the axis of rotation, vanish; or to put it practically, that there is no centrifugal couple in any axial plane.

In the next place, if we constrain (pivot) one end of a rotating body (statically) balanced but dynamically out of balance, while the other end is arranged to float in a bearing supported by springs so that it may move, say, in a horizontal plane, Fig. 2, then the oscillations of the body will be angular, as from A to B. Under these conditions the observer will be unable to tell whether the vibrations are due to a force (centrifugal) acting somewhere on the body or to a centrifugal couple, unless he knows beforehand that the body is in perfect static balance, under which conditions the vibratory effect can be due only to dynamic unbalance. This being the case, in view of the reaction of the constrained end, it is perfectly possible to balance the effect of a centrifugal couple by means of a centrifugal *force*. Thus, in Fig. 3, if it is assumed that the dynamic unbalance is due to the couple *a-b*, it will always be possible to select a centrifugal force *c*, such

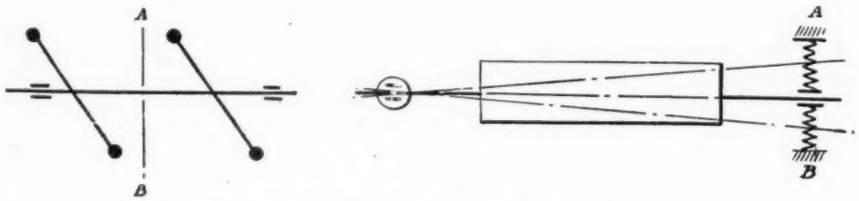


Fig. 2—One bearing pivoted and one floating

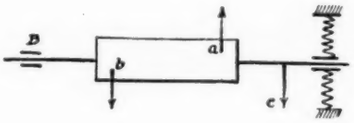


Fig. 3—Centrifugal couple balanced by a centrifugal force

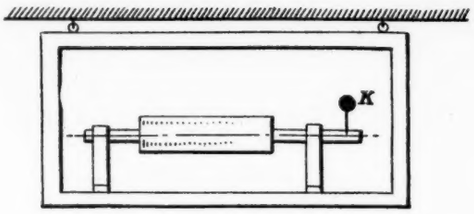


Fig. 4—Body supported in swinging frame for securing static balance

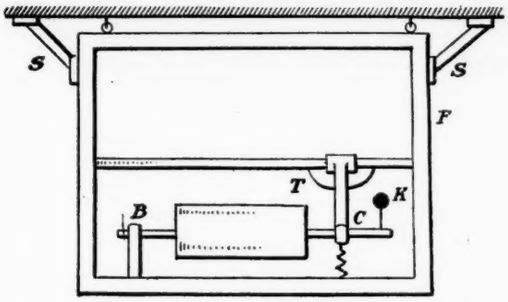


Fig. 5—Body with one floating bearing supported in rigid frame for securing dynamic balance

that it will quiet the vibrating body, and because of its known distance from the bearing *B*, establish the exact value, sign and angular position of the disturbing centrifugal couple *a-b*.

Using Centrifugal Force

It is thus clearly seen that it is possible to utilize a centrifugal force to good advantage in finding both static and dynamic unbalance of bodies; and combining the principles illustrated in Figs. 2 and 4, we have a combination static and dynamic balancing machine, of which the scheme is as follows:

A frame *F*, Fig. 5, supports the bearings *B* and *C*, which carry the body. The frame has a swinging period of its own. The bearing *C* may either be locked, so that it acts exactly like the rigid bearing *B*, or else it may be allowed to float in a vertical plane, bringing into play certain resistances (springs) opposing its deflection from the neutral (vertical) position. The correcting centrifugal force is indicated by *k*.

Such a system is known in dynamics as a *system with two degrees of freedom*, in general being capable of two kinds of motion: swinging of the frame, the bearing *C* being maintained rigid; and swinging of the bearing *C*, the frame *F* being maintained rigid by such means as brackets *S*; while the most general motion consists of a combination of these two motions.

Operation Is Simple

The operation of such a combination machine is very clear. In order to secure static balance we lock the bearing *C* and unlock the frame supports *S*. Then, by properly adjusting the magnitude and direction of *k* we can reduce to zero the bodily oscillations of the frame *F*, thus establishing the exact value and sign of static unbalance in ounce-inch units. As soon as this has been corrected, we lock the frame *F* and unlock the bearings *C*, when the same centrifugal force *k*, created by a suitable adjustment of the clamp as explained above, can be made to correct the body for dynamic unbalance, as illustrated in Fig. 2. The advantage of basing the results on the centrifugal force instead of on a centrifugal couple is manifest, the former being a *fundamental*, and the latter a *derived*, unit, so that the former is capable of much greater accuracy in adjustment and of more direct application than the latter.

Fig. 6 illustrates a balancing machine built in accordance with the scheme of Fig. 5. The yielding support, clearly shown on the right, has means for easy adjustment of its period, as likewise has the frame itself. The motor is of 1-3 hp. capacity and operates the body, through a countershaft, by a rubber belt. The balancing clamp is seen on the extreme right of the crankshaft. The oscillations are read by means of ordinary Starrett dial gages, graduated in thousandths of an inch. The precision which can be secured on such a machine is almost uncanny; it enables one to see the sluggishness of the method of balancing on ways and therefore the absolute lack of precision of dynamic balance that might be based on such results. A well-designed clamp is very easily handled, and its correct position can be established in a few minutes. Its indications are capable of tabular interpretation, so that the operator merely has to carry out the simple instructions, worked out beforehand. Of course, it is clear that such a machine can be built for any size of body, or for any speed that may be desired.

Buda Instruction Book

A very elaborate and particularly clear instruction book has been prepared by the Buda Co., Harvey, Ill., this being intended for users of Buda motors. It is a book which would be invaluable to a repair man since it gives precise instructions for adjustments. There are also both half-tones and line cuts showing sections of the engine at many different points.

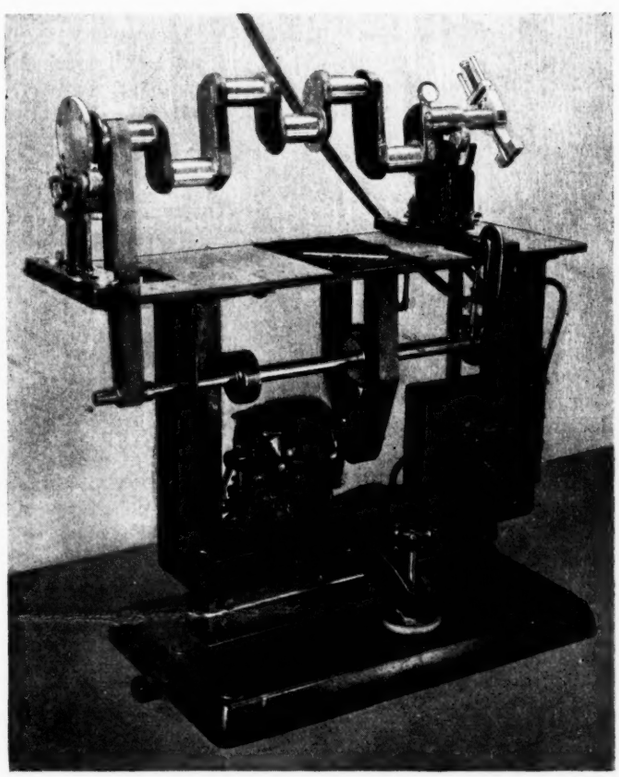


Fig. 6—Example of combined static and dynamic balancing

Safety Engineering in Automotive Plants

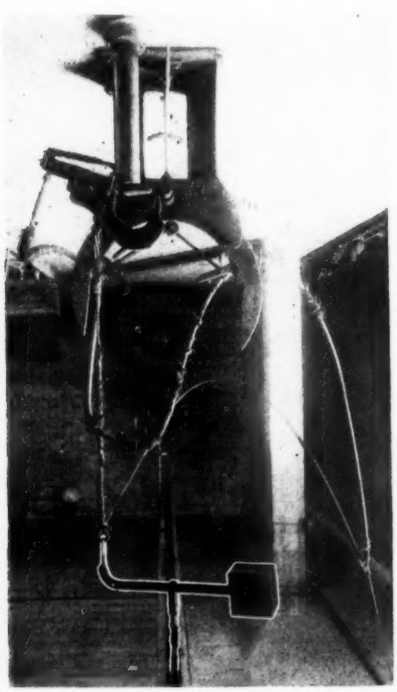
Part III

Protecting Workers in Forge Shops—Avoiding Trip Hammer Accidents—Keep Dies Closed When Machine Is Idle—Sparks and Excessive Heat Are Problems to Be Met

ACCIDENTS of various kinds occur in the forge shops of automobile plants. Many shops use board hammers, and accidents are caused by flying boards. These can be provided against by erecting steel guards over the hammers so that when a board splits or breaks it cannot get into the belts or fly up to the pulleys.

Another kind of accident in the forge shop is due to not using props when changing dies in the drop hammers. One of the helpers may accidentally set the hammer going and the result most likely will be that the man changing the die loses his fingers. A good rule to follow in any drop forging plant is to always have the hammer down at the end of the day's work and during recess. The value of this rule is illustrated by an accident to an Italian laborer in the Remington Arms Co.'s Bridgeport plant, which was reported to the National Safety Congress by F. J. Carrigan.

The Italian was carrying a box of bolts from one side of the shop to the other. He stepped back of one of the hammers and reached in between the two dies. The upper one was not resting securely on the die block; it fell off, hit the treadle and tripped the hammer, with the result that the man lost three fingers. It has now been made a rule in the shop that whenever the hammers are shut down for any reason, the foreman must release the latch and let the top hammer rest on the bottom. The hammers are always in this position when not in actual use. The same rule can be profitably applied to steam hammers, the pistons of which are often left up in the cylinders at the end of a day's run.



Weight used to counterbalance riveting hammers mounted on a standard Palmer-Bee track and trolley

Quite a number of serious accidents have occurred on hammers used for straightening malleable castings. J. R. Anderson, chief inspector of the Michigan Workmen's Compensation Mutual Insurance Co., tells of a proposed safeguard that did not prove effective. After a workman had lost four fingers, the trip on the hammer was so fixed that he could not reach it with his feet. In order to operate the hammer he had to reach back, and it was believed that he could not at the same time get his hand in between the dies, but he showed that he could, and the insurance company had to pay for it. The man had no business working on the hammer by which he was injured. He ran out of material on the hammer he was working on, so he stepped over to this one, picked up a casting and threw it in. He tripped and put his hand in—and the accident was complete. Ordinarily the castings are put in by means of pliers, and if he had been an experienced man he would have known how to use them.

Used Two Levers on Hammers

The Reo Motor Car Co. fitted two hand levers on each of a couple of striking hammers, but as it is sometimes necessary for the operators to work one of these hammers together with a new man, production is greatly curtailed, and so one of the levers was discarded. The hammers originally came with treadles, but these were taken off and levers put on instead. The Packard company is using treadles on steam hammers. The same concern is at present experimenting with a wire mesh guard, which has a hole in it enabling the man to put a stick through and work the die. The men are complaining that it cuts down production, but one good feature is that if a man slips he can put his hand on the guard and will not fall into the hammer.

One objection raised to screens is that they interfere with the work, especially where heavy material like axle forgings is handled. In the Packard plant the axles are carried on a trolley right back of the die blocks. There is a take-off man at the back whose only duty consists in receiving the stock after it has been hammered, putting it into the trimming die, and laying it into the socket, where it is stamped and then thrown out. While this man is trimming the forging, the other operator has a piece in the machine, so he is in very little danger except from flying scale, and he is protected against this by goggles, asbestos gloves and an asbestos apron.

To prevent the drop-hammer men from being struck by flying scale, pieces of flash, etc., a novel swinging shield is being used by the Packard company which was explained by Mr. Williams. A piece of 4-in. tube with a standard pipe header at the bottom end is set 4 ft. into the ground. Another pipe is fitted into this, with a hanging shield which when the men are operating the hammer swings directly in front of the die block. Any scale or flash that is broken off hits this shield and drops down directly back of the hammer. Even the work when completed strikes the shield and drops down to the floor.

When it is desired to change the dies, all that is necessary is to take hold of the shield and swing it around through an angle of 90 deg. When taking away the stock and cleaning away the scale the shield is swung to one side. It is not directly connected to the hammer, but stands one foot away from the base of the press, leaving a clearance of two feet between it and the die block. It is made of No. 10 gage steel plate and has to be changed about once every six months. Since the installation of these shields in the Packard forge shops, not half as many men from this department have gone to the hospital as previously.

Guards for Sparks

To prevent sparks from hot saws striking operators in the face, the Remington Arms Co. provide the saws at their Bridgeport plant with shields which have an opening at the bottom, and place a tank of water underneath this opening to catch the sparks. It is not possible to absolutely eliminate all sparks in this way, but the evil is greatly mitigated. The Reo Motor Car Co. took off the guard furnished by the manufacturer of the saw and put on a 2-in. piece of channel iron; in this an indentation was made and water was put in to catch the sparks. This worked out pretty well, yet something better would be desirable according to Mr. Livingstone, the company's safety engineer. One company tried to prevent sparks flying into the men's eyes by placing a sheet-metal guard on one side of the drop hammer. This shields men walking back of the hammer, but the helper works in front. Goggles were tried for the helpers and proved unsatisfactory, the men claiming that they could not wear them and run the hammers. One of the troubles is that the glasses become very hot from the heat of the furnaces.

Various methods have been tried to shield the men from the excessive heat radiated by the furnaces, which is especially obnoxious during the summer period when the temperature alongside the forges may reach 160 deg. The Reo company use a so-called water door, invented by one of their foremen. A constant spray of water is maintained in front of the furnace door and the sheet metal back on it. The water is in between and runs off through an outlet near the furnace. This has proven very satisfactory. According to Mr. Shaw, the superintendent of the Ford plant equipped several furnaces in this way, and he also tried a partition in front of them, which also kept back the heat. A solid plate close to the front of the oven was more effective than the running water.

The Packard Motor Car Co. has had the same problem to contend with, and at present is trying out four different methods, according to Mr. Williams, the experiments having been going on for nearly a year. The first method consists in the use of an air curtain 12 in. in front of the furnace. A column of air from a 2-in. pipe is shot up into the hood. The second method is identical with the water-door plan already described. The third method consists in hanging chains in front of the furnace, about a foot and a half away. By the fourth method, the cast front of the furnace is placed at a distance of about 10 in. from the furnace proper, with a filling of asbestos or similar heat-insulating material between, and water is used on the casting. In connection with this, air is blown upward into the hood. All of the Packard furnaces have hoods that carry the heat to the ventilator stack. It is too early yet to say which of the methods will prove the best, but the men seem to prefer the chains. Mr. Williams promises that as soon as definite conclusions are reached they will be communicated to the National Safety Council.

Critical Point in Labor Turnover

(*Continued from page 1053*)

remedies, and losses large enough to prove that it is sound business to adopt the remedies and avoid the losses. A description of remedies that have proved successful, interesting as they are, cannot be attempted here.

There are many other aspects of the matter that still remain to be explored. What are the relations between absences and tardiness and labor turnover? Cannot absences and tardiness be studied in the same way as labor turnover? What are to be the relations of labor-turnover control to such problems as trade education, promotion policies, the intellectual life of the industrial community, the mobility of labor, scientific management, women in industry? Will it be wiser to leave the broad problem of control of labor turnover entirely in the hands of employers, or should the state or labor unions have a voice in the control?

These are questions both of the present and of the future. In thinking about them and working over them it is important to bear in mind the value of scientific method. The discovery of a unit of measurement, a method of measurement, analysis and classification, has made possible great advances in this one small part of the labor problem.

Let us get the facts in the labor situation—all of them. Just as Darwin always recorded all facts which tended to contradict his hypotheses because he knew that unless he did so he would be apt to overlook those facts in order to make his hypotheses triumph, let us also recognize the presence of personal and business interests and bias in ourselves as well as in others. Let us never dodge or shirk the facts. Let us record them so that we and others can study them at any time. Let us measure when means of measurement are obtainable. Let us analyze, weigh, test and fearlessly experiment. Let us invoke our finest constructive imagination in making our hypotheses. Let us not be dogmatic, but humble with our theories—ready to throw them away if need be when new facts are recognized.

Let us, last of all, never overlook the human instincts. They lie at the heart of our problem. Because of much past neglect in the handling of this question they require the greater emphasis now.

It is unquestionably a human trait that every person wants to have some sort of control of the circumstances and direction of his own life and of his work as a part of life. For this reason I believe not only in scientific method and spirit, but I also believe that science must join hands with organized democracy in order to reach any sound solution of the greatest of all our problems. To find the methods and forms of organization through which such a solution may be obtained is the task that lies ahead of us.

The FORUM

Would Run Engines Hotter

By L. Cammen

I WOULD like to open a discussion in your columns as to whether it is worth while to go on, in these critical days, to burn gasoline to save radiator water. This is what we are all doing. Permit me to explain.

Tests made by J. B. Replogle, D. McCall White and others have confirmed what we have known all along, that, at half-throttle, a far higher efficiency can be obtained with higher water temperatures than with lower temperatures. The Franklin car through its air cooling does obtain such better economies in fuel utilization, and there is no reason whatsoever why the water-cooled car should not be made as economical as the air-cooled car.

Nevertheless, we are running our cars and trucks with the wasteful water temperature of 180 deg. (some even lower) when we could run them at 210 deg. and save some 40 per cent in fuel consumption. Is this good policy in these days of gasoline stringency? It would be very simple to meet this problem by the slight changes in fits of piston rings, etc., necessary to run the engine at higher temperatures, and thus save hundreds of millions of gallons of fuel.

The days of ease in the industry have gone; we must show the public the way to operate cars, whether passenger or commercial, economically, if we want the public to patronize us. Why then not start out by getting our products to operate at the most economical temperatures when this can be done with so little trouble?

Crankshaft Stress Error

By Otto M. Burkhardt

IN my paper, "Analysis of Crankshaft Stresses," Part II (Nov. 29 issue), I notice that the dimensions given in Fig. 13 are based on a crank cheek thickness of 1 in. In the text this thickness is determined as 15/16 and 7/8 for the 6 and 12-cylinder engine respectively. As Fig. 13 refers to both engines, it can serve as a principal sketch only, while the final dimensions may be taken from the text.

Data Wanted on Oil Dilution

NO exact data are available covering the amount of leakage of gasoline into the crankcase. A number of concerns have been doing experimental work along this line, but it seems practically impossible to arrive at a fixed proportion which would reasonably be expected to work its way past the rings and into the case on a cold engine. The results obtained from experiments are so erratic that no definite conclusions can be drawn, since the amount which enters the crankcase depends upon the fit of the pistons and rings and also, more than anything else, on the quality of gasoline going into the cylinders.

When the engine is cold the gasoline goes by the piston quite rapidly, and after the engine warms up it almost entirely disappears. Nevertheless, during the short period that it is in the crankcase, particularly during the critical time while the engine is cold, considerable damage may be done. Most of the trouble in service seems to be caused by the choking devices used at the present time. These put such an extremely raw mixture of gasoline into the cylinders that only a small part of it is burned. While the motor is running cold with the choke closed, a stream of raw gasoline is entering the cylinders and going down the walls, a certain percentage of which is bound to find its way past the rings and into the crankcase.

This condition is not altogether preventable, except by pre-heating before starting. The only thing which can be done is to decrease as much as possible the period of time required to warm the engine, and at the same time, during this warming up period, to run as lean a mixture as possible. It is to approximate this condition that manufacturers are building some of their motors with a portion of the intake manifold cast integrally with the exhaust, and this seems to help the situation more than any other method which has been devised. Water-jacketing the intake is a big help, particularly as regards running temperature. The big objection, however, is that it does not warm up fast enough. The heat from the exhaust is better, principally because there is more of it available and the warming-up time is so much quicker.

Airplanes Come First

By A. D. T. Libby

I HAVE been reading, with considerable interest, the article "Beginning a Great Economic Mistake" in your issue of Nov. 8 and other articles relating thereto in the same issue and in your issue of Nov. 15. The idea conveyed from these articles is that the automobile industry should continue at its present pace. Naturally it cannot continue at the same pace if the supply of material is curtailed or cut off or the demand for cars becomes less. On first thought it might seem wise to let the law of "supply and demand" act as the regulator; but it seems to me, and I am basing this statement on first-hand information, that some of our automobile plants in their entirety should be turned over to the production of airplanes. It is a fact that we do not have enough airplanes at the present time or in sight to instruct men who would become aviators in the service of their country. We are to-day losing most valuable time in not preparing to put into France without delay not less than 150,000 air planes and 25,000 tanks.

Thinks Germany Will Concentrate on Airplanes

It is my opinion that Germany has already seen the futility of the submarine campaign and will turn all her energies to building a tremendous air fleet that will discount our production together with that of France and England and we have been asleep at the switch. There can be no disputing the fact that operations in the air next year will assume tremendous proportions, and if we are going to hand out a "lick" let's put a "punch" behind it. There is no reason why our automobile factory organizations should be disrupted so that after the war is over they cannot take up again their regular line of work; but there is every reason that they should devote whatever part of their capacity found necessary to get immediately the aircraft and tanks so that we can do some real fighting.

U. S. Lacks Training Airplanes

The war is going on in its fourth year and we have been legally engaged for over seven months and we have not airplanes enough to equip our training schools, to say nothing of building fighting and bombing machines. In the face of this, why should we continue using up material to keep our factories busy making a product the major part of which is used for pleasure purposes?

We need all our resources in this war. Let our automobile factories be turned loose on the manufacture of things which have already been proven as vitally necessary in the prosecution of the war. Let's build the things we need and not the things we can get on without. It seems to me that it is high time we did some real manufacturing of airplanes and tanks.

Germany has from the beginning laughed at our ability to

"get into" the war, and she will continue to laugh unless we get busy and build the things that can knock the laugh out.

A Great Tactical Mistake

EDITOR'S NOTE—We would be willing to agree with Mr. Libby's views *if* it were possible to turn the whole industry immediately and instantaneously to airplane production. If we could make 200,000 airplanes instead of 1,000,000 passenger cars with the *same* equipment and the *same* workpeople in the *same* time, it would, without doubt, be the right thing to do.

If we could do this thing the war would be of such short duration that the extinction of all other industries would be temporarily worth while.

Unfortunately, however, airplane and airplane engine manufacture requires:

1. Special factory equipment.
2. Specially trained men.

Very little of the machinery we have in the automobile plants is good enough for airplane work, and a still smaller proportion of our workpeople are skilled enough. To manufacture hastily a great quantity of bad and inefficient airplanes would be a great *tactical* mistake. By a wholesale transfer of automobile plants to airplane building we could not hope to get anything except pretty poor product.

It is a fact that we must use for aircraft every last tool and every last man that will help toward the most rapid possible production of the *best possible planes*. As time goes on it will be possible to increase our output. Already practically all the equipment and all the valuable personnel of the automobile industry *is* engaged on the manufacture of airplanes.

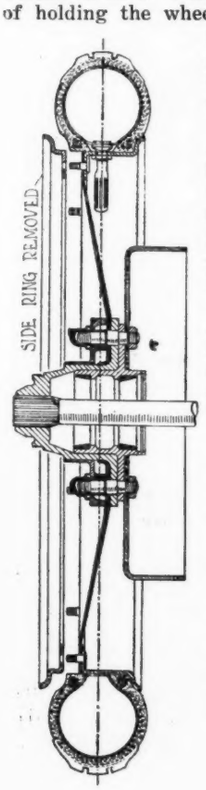
As time goes on we shall have more equipment and will have trained more men and women. A complete cessation of automobile manufacture would not speed up airplane production in the least. It is just as difficult to turn over an automobile factory to *good* airplane engine making as to shell or fuse production. Natural shrinkage in the demand till little if anything more than the absolutely essential is left will control passenger car output in proportion as our ability to use more plants and more men on airplanes increases.

Disteel Pressed Steel Disk Wheels Now Being Manufactured

THE Detroit Pressed Steel Co., Detroit, has developed and is starting production on pressed steel disk wheels for passenger cars, trucks and tractors. The passenger car wheels are styled "Disteel Wheels" and are of the single disk type, but those for trucks or tractors are either single or dual disk, depending on the size of the car in question.

Few Parts in Wheel

The finished wheel as it now stands comprises a surprisingly few number of parts. A cast steel hub is fastened to the axle and in the manner required by the axle construction, and to this the dished steel disk is secured, slipping over the four studs on the permanent hub flange. The wheel is securely locked in place by means of a wheel locking flange which carries the four nuts and their lock washers in a self-contained unit. This system has been found better than that of holding the wheel in place by one large nut. Not only is less force required in removing and replacing the wheel, but also the possibility of the nuts setting in place is removed.



The rim is integral with the dished steel disk and has an outer ring that is held in place by eleven nuts on the 34-in. type. This construction is noteworthy because of the extreme lightness of the parts without loss of strength and because the outer ring when removed leaves the casing entirely free.

As stated, the hubs of these wheels are cast steel. The disk and rim are ordinary 25-point carbon blue annealed steel, the flange varying in thickness from 3/16 in. to 3/32 in.

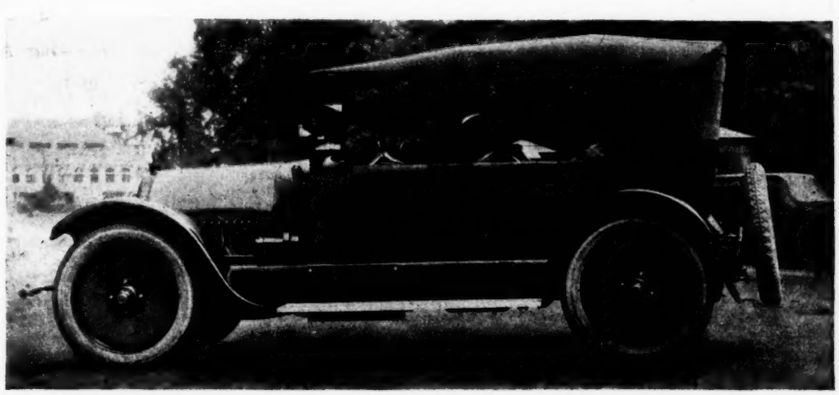
Although it is not claimed that the wheel is not in any sense of the word a flexible wheel, the absolute rigidity of many dual disk wheels is removed by the dished disk construction. By this construction it will be noted that the load line crosses the disk, eliminating a concentration at any definite point. The load is carried both in compression and suspension over the entire surface.

This wheel has been twice described in AUTOMOTIVE INDUSTRIES when it was in the experimental stages. Its special feature which distinguishes it from all other disk wheels is that the thickness of the metal is reduced from the center outward to the edges, thus proportioning the strength to the stress. In the experimental wheels this tapering was done by turning the disk, but in production a rolling process is used, the machine performing the rolling having been developed simultaneously with the wheel itself.

Bent Wheels Can Be Straightened

Among the advantages claimed for this wheel are freedom from climatic effects, such as shrinking, swelling, cracking, etc., and the ability to endure shock without complete destruction; if bent the wheels may be straightened without much difficulty. Because of the fact that all of the wheel is inside of the tire tread, it is much more protected from accident than either the wooden or wire wheel. The design harmonizes nicely with the present streamline body lines, and effectively conceals all parts such as brakes, rods, etc.

At present the Detroit Pressed Steel Co. is equipped to manufacture wheels for the following cars: Cadillac, Peerless, Packard, McFarlan, Murray, Fergus, Winton, Olds, Hale, Hupp, Dorris, King, Jordan, Chalmers, Hudson. The cost to the individual user is about the same as a wire wheel, that on the Cadillac and Packard being about $130 at the present time.



Left—Disteel wheel mounted on a ¾ floating type rear axle. The load line passes through the disk

Right — Disteel wheels conform harmoniously with the present type of body design, concealing brake bands and rods

AUTOMOTIVE INDUSTRIES THE AUTOMOBILE

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Material Organization

THE internal organization of a manufacturing concern can make that concern or break it. More than that, the bad arrangement of one of the vital parts of the internal organization can throw that concern upon the rocks of bankruptcy. Still more specifically, if the organization which takes care of the material supply and the incoming stock is not all that it should be, thousands or even hundreds of thousands of dollars can be so tied up that the profits of the company may be wiped off the slate.

There have been instances in the automobile industry within the memories of those who have only been engaged in this business for the past 5 years where companies producing a good car in large quantities have suddenly been thrown into receivership, when to all outward appearance the company was prosperous. The canker worm of an unbalanced stock inventory had so eaten into the vitals of these concerns that in spite of a big production of a good marketable product, the concern tottered and fell because of the internal disorder due to an incorrect organization. It is a matter which concerns every manufacturing business regardless of the industry of which it is a part, but above all it is a message which should be carried home direct to the automobile manufacturer. Because of the relatively small profits per car and the great competition he must face in every price field, it is necessary for internal efficiency to be at its highest point.

It is useless to spend months in making time and motion studies of the manufacturing ends of the business for the purpose of cutting $25 from the manufacturing cost of each car, when in the same plant every month sees thousands and thousands of dollars' worth of material tied in such a knot through an unbalanced stock inventory that it represents a dragging brake on the wheels of progress of that concern.

There are companies which have been forced to build huge warehouses to store materials bought at a figure which, while slightly below the market price, represents an overwhelming investment when the space required to store them, the interest on the purchase price and the labor and costs of building the warehouses are figured into the inventory. So important is the internal organization of the buying or incoming end of an automobile manufacturing business that proper arrangement and supervision may well spell success, while improper regulation and failure to foresee conditions in their proper light may readily spell disaster in these days of keen competition and minimum prices.

Tractor Standards

THE tractor standards division of the S. A. E. has now almost as long a program of work before it as the whole standards committee had a few years ago. Nothing could speak more eloquently of the progress in standardization of automotive products than the last report of the tractor division. It is more striking than even the huge list of subjects before the aeronautical division, because the latter is working very closely with the government and the tractor division has no such assistance.

Automobile standardization is proceeding slowly just now, but the tractor, the airplane and the motorcycle are being standardized with such rapidity that they will soon catch up with the passenger car in this respect, even if they do not take the lead. This is a very positive proof of the value of standards. Had it not been for the pioneer work done for the passenger car and truck, originally against considerable opposition, the speed of production of the machines we need for war would have been much slower.

The tractor standards seem to be progressing along extremely sane lines, and it is very encouraging to observe how the appreciation of standards has extended to the old-line tractor men. It has required very little propaganda to convince them that the co-ordination prevailing in the automobile industry would be of equal benefit to theirs.

It is to be hoped that the tractor manufacturers will do all they can do familiarize the farmer with the existence of standards by telling him which parts of their machines conform to S. A. E. specification.

In the automobile field the use of standards has been too little advertised by manufacturers to their customers. How few catalogues there are which list the S. A. E. standards used on pieces which affect the owner. Where flanges are standard, as they usually are, the catalogue should state that the flange gaskets are S. A. E. standard number so and so; and similarly on all other parts which would be mentioned in the instruction book. Jobbers should be requested to make more use of the standards in their literature. There are still many wholesale catalogues in which not a single part is named as a standard even though it be one.

These things mean that the usefulness of the standards to automobile owners, and still more to dealers and repairmen, is less than it ought to be. No doubt time will effect a cure, and the various standards now used and recognized in the factories will come to be recognized as well as used in other places. With the tractor field, however, there is a chance to get in on the ground floor. There is opportunity to start teaching the dealer and the farmer of the existence of standards right now, as the business is growing.

Starters for Tractors

JUST now the chances of the electric starter in the farm tractor field seem to be receiving considerable attention. It is not to be wondered at that the starter manufacturers, after having conquered the entire passenger car field and a considerable section of the motor truck field, feel hopeful that they can overcome all difficulties of the problem. The familiarity of the farmer with the advantages of the starter from his automobile experience should prove helpful in this respect. Other factors that favor the starter are the scarcity of farm labor, which makes it necessary that boys and even women operate the tractor; the occasional necessity for night plowing when electric illumination permits better results than the old-fashioned oil lantern, and the growing cost of fuels of all kinds.

The big question, of course, is that of cost. Is the investment required warranted in view of the fact that a tractor is used only a part of each season and that in ordinary work the engine is stopped and started only a few times a day?

There is absolutely no question but that all engineering problems involved can be satisfactorily solved. The amount of wiring should be cut down to a minimum and what wiring there is should be inclosed in substantial metal tubes so it cannot be injured by the careless handling of tools. To make the installation serviceable the engine builder must make provision in his engine design for rigidly mounting both the generator and starter. There need be no great difficulties attached to the battery problem. Frequent starts are not necessary, weight saving is not so important (hence a heavier type of battery can be used than for passenger cars) and the battery can be hung on springs and mounted on cushions if necessary.

A beginning has been made in the fitting of starters to tractors, one of the largest manufacturers furnishing them as regular equipment. A somewhat inconvenient location of the engine on this tractor, whereby the wheel spokes sometimes interfere with the application of a hand crank, probably had something to do with the decision to fit a starter.

If the engines are built so that a generator and starter can be mounted properly the starter manufacturers can take the matter up with the farmer—who in any case must be the final judge—possibly through local agencies and service stations. But to secure the very best kind of a job, especially as regards the arrangement of the wiring, the starter must be fitted when the tractor is built. There is certainly a strong tendency to eliminate drudgery on the farm and the adoption of starters would be directly in line with this tendency. Whether the cost is too great an obstacle to make the starter a recognized part of a tractor remains to be seen.

Uninformed Executives

IT is to be sincerely hoped that the next meeting of the N. A. C. C. will not require a Hugh Chalmers to bolster up the backbone of manufacturers in an industry as essential as that which deals with the transportation of millions of American citizens.

The uninformed executive is a menace to his business and also an injury to his industry. This is particularly true under present conditions where circumstances are changing almost daily. The executive who does not keep his head high enough above his own work to see what is going on around him can no more operate his business correctly than a man could steer an ocean liner from the engine room. It takes the helmsman who is on the bridge, high above the machinery which propels the vessel, to avoid the rocks and to safely guide his craft through the troublesome waters.

This same condition applies to the ship of business. It is well enough for the men who take care of the machinery to remain close to their respective tasks, seeing that the orders they receive are faithfully and intelligently carried out. For those who are steering the business, however, it is necessary to remain aloof. They must know that faithful subordinates are keeping the machinery of organization humming smoothly, because that is necessary to give them the peace of mind which produces the calm thought necessary in studying and interpreting conditions as complex as those which now confront the industries.

The recent meeting of the N. A. C. C. held in Detroit indicated one fact more clearly than anything else. It showed that a great percentage of our manufacturers and executives are not informed. It is impossible to steer the ship of business successfully through an uncharted sea, and the chart which will enable the executive to safely pilot his own particular business through unknown conditions is the knowledge which is given by closely interpreting the meaning of the daily news and daily events into terms which apply directly to the particular business he is engaged in.

Latest News of the

Place Contracts for 10,000 B Trucks

Seventeen Makers Get Assembly Orders at $720-$800 Per Truck

WASHINGTON, D. C., Dec. 11—Contracts for the assembly of 10,000 Class B 3-ton standardized war trucks have been placed by the Military Truck Production Board, Quartermaster's Corps. Seventeen truck makers have been given contracts for this work, the number given to each concern being either 500 or 1000. Three concerns, namely Gramm-Bernstein, Selden and Pierce-Arrow, have been given contracts for 1000 each and it is possible that the General Motors Truck Co. will assemble a similar number.

The complete list of contracts awarded, which approximates $50,000,000, follows:

500 Each

Bethlehem Motors Corp.....Allentown, Pa.
Brockway Motor Truck Co...Cortland, N. Y.
Diamond T Motor Car Co.....Chicago
Garford Motor Truck Co.....Lima, O.
General Motors Truck Co.....Pontiac
Indiana Truck Co.....Marion, Ind.
Kelly-Springfield Motor Truck Co. Springfield, O.
Kissel Motor Car Co.....Hartford, Wis.
Packard Motor Car Co.....Detroit
Republic Motor Truck Co.....Alma, Mich.
Service Motor Truck Co.....Wabash, Ind.
Sterling Motor Truck Co.....Milwaukee
United States Motor Truck Co....Cincinnati
Velie Motors Corp.....Moline, Ill.

1000 Each

Gramm-Bernstein Co.....Lima, O.
Pierce-Arrow Motor Car Co.....Buffalo
Selden Motor Vehicle Co.....Rochester

These trucks will be delivered beginning in January up to July 1. It is not known definitely what the assembly price is but it is rumored to range between $720 and $800 per chassis. In this assembly work the Government supplies all of the parts and components and pays the transportation from the parts maker to the factory doing the assembling. The assembler will have to pay for labor, insurance, breakage, and it is expected painting, necessary testing, and perhaps a certain quantity of small parts, such as connections, etc., although there is nothing specifically given out on this subject.

When the Military Truck Production Board first took up the questions of price for assembly it started with competitive bids. There was so wide a range in this field that it was judged best to set a flat price. With such a price lying possibly between the ranges of $720 and $800, the factory with a good assembly system will make that profit which its efficiency methods give it title to as compared with the other factory that has not such a system.

While the price apparently agreed upon may be high, it must be understood that this work will interfere to quite an extent with the general production of the company. The Military Truck Production Board seems to have had in mind that necessary policy of retaining industries and giving a good legitimate working profit.

For some time it was anticipated that some of the concerns with large Government orders might not be interested in accepting Government contracts for this assembly work, but such companies as Garford, Velie, Kelly-Springfield, General Motors Truck, Packard, and Pierce-Arrow falling in this classification are listed as those taking contracts.

The policy of the Military Truck Production Board in furnishing the parts for the truck to the assemblers has eliminated the necessity of any special financing on the part of the assemblers. It was expected that if the Government did not do this some of the companies taking contracts would have to ask the Government for loans covering the purchase of the parts. This has been eliminated by the present plan.

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Sarver Heads Scripps-Booth

DETROIT, Dec. 10—As has been known for some time, control of the Scripps-Booth Corp. has passed into the hands of the General Motors Corp., and at present reorganization of the company and plans for the future are being made. As announced in the Oct. 25 issue of AUTOMOTIVE INDUSTRIES, Clarence H. Booth resigned from the presidency of the company, and since that time, A. H. Sarver, a former Buick man, has been in practical control. A meeting of the stockholders was held recently, but a quorum was not present, and hence permanent elections could not be made at that time, or definite plans for the future formulated. However, part were elected, and the meeting adjourned until Dec. 14, when it is expected that the reorganization will be completed. Though the details of the first meeting are held confidential, it is expected that A. H. Sarver will be president.

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No Ford Price Increase

DETROIT, Dec. 7—The treasurer's office of the Ford Motor Co. advises that no $100 price increase is expected on Jan. 1. If such a price increase has been planned, the treasurer's office has not been notified.

Rubber Importation All Centralized

Must Be Consigned to Rubber Association, Which Acts for War Trade Board

NEW YORK, Dec. 11—In future all rubber imported into the United States must be consigned to the Rubber Association of America, who are acting as representatives of the War Trade Board under the board's instructions. The purchaser of the rubber will be advised of its receipt and to obtain the rubber is required to make declaration on specified forms, of which the principal part is a guarantee neither to export nor to permit export of any rubber or rubber article without license from the War Trade Board.

This new system replaces the former "gentleman's agreement" between the British Government and American importers in force since the early months of the war. The purpose is to prevent absolutely the obtaining of rubber by Germany or any of her allies. The United States Government through the War Trade Board requested the association to take this action, and a committee appointed to handle the matter known as the Rubber and Kindred Products Committee consists of the following:

Charles T. Wilson, Chairman; H. Stuart Hotchkiss, B. G. Work, Henry Spadone, William E. Bruyn, G. B. Hodgman, W. J. Kelly, E. H. Huxley, H. S. Vorhis, Secretary.

Licenses for export of manufactured rubber can be obtained from the War Trade Board, and in signing the form which permits the importation the manufacturer binds himself not only not to export, but also not to sell to any person in the United States unless satisfied that there is no intention on his part to attempt to export or resell for export without license.

(*Continued on page* 1070)

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Kerosene Advanced One Cent

NEW YORK, Dec. 11—The Standard Oil Co. of New York has increased the price of kerosene one cent a gallon, bringing present prices to 14 cents in barrels and 10 cents tank wagon basis. The advance is taken to indicate that the question of government fixing of oil prices is not one of immediate consideration. The advance follows an increase in the price of crude oil to $3.75 a barrel, the highest price in more than 40 years.

Automotive Industries

Industries Mobilize for War Purposes

Gifford Emphasizes Need to Maintain All Industries, All Being Essential

WASHINGTON, Dec. 12—The United States Chamber of Commerce held a meeting to-day for the mobilization of the industries of the United States for war purposes. Speakers included President Rhett, of the Chamber of Commerce; W. F. Gifford, director of the Counsel of National Defense; Daniel Willard, chairman of the War Industries Board; Harry A. Garfield, Fuel Administrator; T. E. Parker, chairman of the Priorities Committee; C. M. Wooley, of the War Trade Board, and George M. Peek, industrial representative of the War Industries Board.

In his address Mr. Gifford said: "It is not going to be an easy task to completely organize industry in this country, but we are going to do it effectively. It is obvious that some industries are going to be more essential than others, but it would be foolhardy to think that the time will not come when the so-called less essential industries will not be needed."

Advises Caution

Gifford advised the various committees representing their industries in Washington to proceed slowly in dealing with the idea that they might be more useful in having offices and headquarters and representatives in Washington, and pointed out that George M. Peek, the new industrial representative of the War Industries Board, would afford a real point of contact, and he closed with a strong plea for team-work of all the committees.

Daniel Willard discussed the British Ministry of Munitions, and said that because a Ministry of Munitions had been established in England it does not follow that such a plan would be successful here. He contrasted the smallness of Great Britain with the vast limits of the United States, and said that while one-man control in a small country might be successful, there were reasons against one-man centralization in a country of the size of the United States.

Councils Distribution of Orders

"One mistake," Mr. Willard said, "has been made. We have concentrated our orders too much in certain localities. This has brought about a housing problem and a transportation problem."

This mistake, Mr. Willard said, has brought about the appointment of George M. Peek to find out what factories are idle or are not running on full time. Mr. Willard pointed out that some industries are and will be more essential than others in the winning of the war, but he said it has come to be generally understood in Washington that there is no such thing as a non-essential industry.

"Nevertheless," Mr. Willard said, "there cannot be such a state of mind as 'business as usual.' The thing to do is to realize and work for 'business for the war.'"

Dr. Harry A. Garfield, Fuel Administrator, also spoke of the so-called less essential industries. The fact had been presented to him that it might be necessary to shut off fuel to such industries, and a list had been presented to him in one of which industries $1,000,000,000 was represented, and which was called a non-essential industry.

Dr. Garfield said he had refused to accept the responsibility for calling that or any other industry a non-essential, and said that no lists of non-essentials would ever be published.

He startled his hearers by proposing the idea that there might be combined action by agreement in each industry for the purpose of reducing the consumption of coal.

There were 300 industries represented at the meeting. There were no representatives of the Automobile Industries Committee there; there were no representatives of the National Automobile Chamber of Commerce present. A. A. Fisher represented the Motor and Accessory Manufacturers Association.

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Avery Acquires Davis Mfg. Co.

MILWAUKEE, Dec. 11—The Davis Mfg. Co., which for some years has been manufacturing all the engines for the tractors of the Avery Co., Peoria, Ill., has been taken over by the latter company. Certain changes in the official staff will be announced the first of the year.

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Express Companies Overloaded

COLUMBUS, Dec. 12—Indicating the strain put upon shipping by war conditions, it is stated here that where the American Express Co. had eight wagons running in Columbus a few months ago it now has 36 of its own and eight that are rented. The other express companies are said to have expanded to a similar extent. A solid carload a day of express, in addition to loose shipments, is received from Cleveland. Dealers state that express now takes as long as freight. A Columbus manufacturer who wished some hardware for army blankets brought it as excess baggage from New England rather than risk either freight or express.

30 Military Trucks Drive to Coast

Full Transport Train to Drive from Detroit to Atlantic Port

DETROIT, MICH., Dec. 12—Thirty Packard military trucks start Friday, Dec. 14, from the Detroit factory, loaded with munitions, for an Atlantic port. They will constitute a full quartermaster corps convoy and be in military hands. Two of the trucks are tank wagons for gasoline and oil supplies and the rest have the regular transport body. The train will be in charge of Capt. Bronson of the Quartermaster Corps and the 79 men are all drawn from those who had experience on the Mexican border.

It is requested by the Council of National Defense that patriotic receptions be arranged for the truck convoy. The route will be via Toledo, Ohio, over the new road constructed at the request of the military authorities.

This driveaway represents the first instance of putting into practice the plans for utilizing the large quantities of military trucks to be built in the West to transport munitions to the coast, thus assisting the railroads instead of giving them the extra task of carrying the trucks. It is understood that the Packard convoy will go right through to the French front as a unit.

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No M. A. M. A. Space at Aero Show

NEW YORK, Dec. 10—While the Motor and Accessories Manufacturers' Association has not withdrawn its sanction for the airplane show it has decided not to allot space to its members. It is stated that it is the Government's desire that a conspicuous display of the airplane industry be not made at this time.

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Many Industries Boost Wages

WASHINGTON, Dec. 11 — October payrolls in the various industries of the country will be the greatest in history. Increases have been made in practically every industry. In the iron and steel trade 61 of 110 establishments made increases, and the total payrolls are 49.2 per cent greater this October than last.

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WASHINGTON, D. C., Dec. 10—Major J. G. Vincent, formerly chief engineer of the Packard Motor Car Co., and now in charge of the entire airplane production program, has recently qualified as an aviator at the field at Dayton, Ohio, where following continuous study, he made his first and succeeding flights with his own machine, successfully.

Gain of 30 Per Cent in Exports

35 Per Cent More Cars Shipped —Trucks Increase 6½ Per Cent—$11,900,897 Total

Mos.	Cars	Value	Trucks	Value	Parts, Value
1917					
Oct.	5,536	$4,481,127	1,333	$4,374,470	$3,045,300
Sept.	4,077	3,645,280	1,251	3,675,717	1,802,051
1916					
Oct.	4,880	$3,756,768	1,144	$3,635,291	$1,949,060

WASHINGTON, Dec. 10—Export figures for the month of October show an average gain in value for that month over September of 30 per cent. Passenger car shipments featured with a gain of 35 per cent, while truck shipments showed an increase of only 6½ per cent. The number of passenger cars exported from the United States during October was 5536 at a value of $4,481,127 as compared with 4077 cars valued at $3,645,280 during the previous month. Truck exports numbered 1333 and were valued at $4,374,470 as compared with 1251 exported in September amounting to $3,675,717.

Slight Difference in October Shipments

There is little difference in the number of truck and car shipments during October and the corresponding month of 1916. During the latter, 4880 passenger cars valued at $3,756,768 and 1144 commercial vehicles valued at $3,635,291 were shipped. The value of parts exported in October, 1917, is 68 per cent greater than during the corresponding month of 1916.

Our biggest buyer is still the United Kingdom, although France is gaining rapidly. Great Britain's purchases, amounting to $2,216,373 included 498 trucks valued at $1,768,529 and 224 cars at $448,844. French purchases totaled $1,934,702, almost a million dollars more than October, 1916, and showed an increase of 110 per cent. Our largest buyer of passenger cars was Canada, which imported 1020 of this type valued at $676,483. Argentina is second, with a record of 875 at a cost of $525,226. The increase in the number of cars bought from the United States by South America is remarkable, Argentina and Chile together nearly doubling their account of October, 1916.

Flottorp to Make Propellers

GRAND RAPIDS, MICH., Dec. 10—The Flottorp Mfg. Co. expects to start production on airplane propellers early next week, and production will be speeded up until about 300 men are employed. Most of these will be cabinet makers and woodworkers, together with some machine men. For the time being the Chicago plant will be continued, but later all manufacturing will be concentrated in the Nelson-Matter building here. At present the necessary machinery is being installed.

Allot Detroit Show Space

DETROIT, Dec. 10—Space in the automobile show to be held Jan. 19 to 26 will be allotted this week. Members of the dealers association will make their selection Wednesday night, and non-members on Saturday night. Space per exhibit has been limited to 1000 sq. ft.

Allen Heads Four-Drive

BIG RAPIDS, MICH., Dec. 10—Jotham Allen is president of the Four-Drive Tractor Co., elected at a recent meeting. J. C. Jenkins is vice-president and sales manager; Albin Johnson is secretary-treasurer, and H. E. Frederick is director succeeding E. J. Jenkins.

Locomobile Strike Called Off

WASHINGTON, D. C., Dec. 10—The Department of Labor states that it has prevented the threatened strike of 2000 men workers at the Locomobile Automobile Co. at Bridgeport.

First Machine-Made Liberty Engine

Delivered Complete on Thanksgiving Day—Vast Airplane Fleet in Sight

WASHINGTON, D. C., Dec. 10—The first machine-made Liberty airplane engine was completed on Thanksgiving Day and a substantial number will be delivered this month. Production of Liberty airplane engines on a quantity basis has actually begun, while at the same time aviators are being graduated in large numbers from training schools here to immediately travel to the fighting lines in Europe. It may be authoritatively stated that the United States is within sight of realization of the great air fleet project mapped out since this country entered the war.

Figures cannot be published for obvious reasons, but it became known here, following the return of members of the Aircraft Board from an inspection trip through the country, that these members are certain that another 60 days will witness men and machines being turned out at a rate insuring success to the original plans. Numerous tests have been made for power, gasoline consumption and for break-down and these have proven the engines to be even more powerful and efficient than was originally claimed for them.

Settle Oil Labor Troubles

WASHINGTON, D. C., Dec. 10—Labor troubles in the California oil fields have been straightened out by the Government by the President's mediation commission. About 10,000 men are affected. Four dollars is to be paid for an eight-hour day and overtime is to be construed as at the request of the Government and not for the operators. It is agreed that there is to be no discrimination or intimidation because of union or non-union affiliations.

Exports of Automobiles, Trucks and Parts for October and Nine Previous Months

	October				Nine Previous Months			
	1916		1917		1916		1917	
	No.	Value	No.	Value	No.	Value	No.	Value
Passenger cars	4,880	$3,756,768	5,536	$4,481,127	51,699	$36,049,497	54,436	$42,161,270
Commercial cars	1,144	3,635,291	1,333	4,374,470	15,917	44,006,346	11,996	30,960,742
Parts, not including engines or tires	.....	1,949,060	.....	3,045,300	.....	20,091,793	.....	24,256,059
	6,024	$9,341,119	7,869	$11,900,897	67,616	$100,147,636	66,432	$97,378,071
BY COUNTRIES 1917	Passenger Cars		Trucks		Passenger Cars		Trucks	
Denmark	.....	.....	.....	.....	247	$223,616	.....	.....
France	103	$105,196	488	$1,829,506	1,261	692,311	2,474	$7,591,305
Norway	.....	.....	.....	.....	675	712,985	.....	.....
Russia in Europe	81	221,009	76	328,294	518	1,267,000	543	1,728,516
United Kingdom	224	448,844	498	1,768,529	1,187	1,692,177	6,318	17,228,204
Canada	1,020	676,483	80	69,709	14,261	10,791,081	696	913,088
Cuba	344	294,716	.....	.....	2,375	2,017,523	.....	.....
Argentina	875	525,226	.....	.....	3,416	2,228,117	.....	.....
Chile	479	452,298	.....	.....	3,064	2,462,351	.....	.....
British India	.....	.....	.....	.....	1,503	1,159,403	.....	.....
Dutch East Indies	93	93,729	.....	.....	1,736	1,708,479	.....	.....
Russia in Asia	.....	.....	.....	.....	260	419,463	193	622,883
Australia	528	378,805	.....	.....	3,462	2,647,459	.....	.....
New Zealand	215	170,036	.....	.....	2,331	1,724,878	.....	.....
Philippine Islands	50	29,817	.....	.....	936	707,971	.....	.....
British South Africa	248	203,924	.....	.....	2,970	2,146,910	.....	.....
Other Countries	1,276	881,044	191	378,432	14,234	9,559,546	1,772	2,876,746
	5,536	$4,481,127	1,331	$4,374,470	54,436	$40,426,811	11,996	$30,960,782

War Brings Change in Selling

Mechanics and Salaried Workers Are Rapidly Becoming Car Buyers

DETROIT, Dec. 7—During the past two weeks retail car sales have picked up, though they are not normal yet. One dealer has found that the war has completely upset the prospect field, and necessitated a complete change in the selling methods. A house-to-house canvass was made of the various districts, and this proved, first, that the rich, or so-called well-to-do class, are not buying cars. These people have their money tied up for the present, at least, and are making old cars do. But it showed that those people that last year could not afford cars now can, and are buying them.

In this class are the mechanics and small retailers. The mechanics are getting good wages, and the retailers are getting the benefits from the present high prices. For example, the canvass showed that out of ten second-hand clothes dealers on one street nine owned cars, and none of them cost less than $1,000. Several cars were sold to men that could not make out their own checks. Drug store owners were found to be worthless prospects, unless owners of chain stores, or employing several clerks—their hours are too long. And all of these were of a class never solicited and that seldom came to the salesrooms to buy a car.

Used car sales are, however, very slow, and many are holding them until the spring for a hoped increase in prices.

Not Pushing Time Business

NEW YORK, Dec. 10—Business along New York's Motor Row remains about the same as it was last week. Following the readjustment to new conditions and the lessening of sales by a certain percentage, things have gone along on a pretty even keel. There is a demand for small cars of the lower prices and those cars in the extreme high-priced class also report a business that is practically the equal of that done a year ago. There is some difference in time sales. People who bought on time because they actually did not have the money to buy with are not buying in such large numbers now. Many buyers who seem to be in the class which could pay cash if it wanted to state that their money is being used elsewhere, and that they wish to purchase on time for that reason. The dealers are not, as a rule, going after time-payment business now.

Sales in South Are Good

DETROIT, Dec. 7—The South is buying cars and manufacturers are using every effort to sell them there. One day this week representatives from thirteen manufacturers were in New Orleans at one time, and nearly every factory reports active sales promotion work. It is the negroes who are buying cars, and they are buying sedans and expensive cars too, as well as the cheaper and lighter cars. The negroes are leasing the plantations on shares, and due to the increased prices for cotton are for the first time getting real money. A year ago cotton was bringing from 15 to 18 cents. To-day the price is about 28 cents for the short and 50 cents for the long grades, and a plot of six acres will place one in the car owner class. The sales have far exceeded the service facilities and the demand for mechanics is great.

Auto Wheel Business Good

LANSING, MICH., Dec. 8—The truck department of the Auto Wheel Co. has been increased largely in the past year and now has business enough to keep it in operation for six months. In the passenger car wheel department, work has been a little slow recently but an increase is expected. Recently a 20 per cent stock dividend was declared and the stock is being distributed.

Good Demand for Shock Absorbers

NEW YORK, Dec. 10—Edward V. Hartford, Inc., reports an unusual volume of dealer orders for shock absorber equipment. In Chicago territory sales have exceeded all previous records.

Maxwell Earnings Ahead of 1916

DETROIT, Dec. 6—From August to October of the new fiscal year the $980,000 dividend requirements of the Maxwell Motor Co. were covered with a substantial surplus. The net earnings are running ahead of those of last year during these months. The resumption of dividends on the second preferred is not contemplated in the near future as a strong working capital is required for the war business after being added to the regular line. For this reason payment for other than the first preferred is not indicated for some time.

G. M. Stock for Employees

PONTIAC, Dec. 8—Employees of the Oakland Motor Car Co., as well as Oakland dealers, branch managers and distributors, are being offered the opportunity to subscribe for General Motors common stock. The stock offered was purchased in the open market. It is said that applications already largely exceed the block of stock set apart for the purpose.

War Meeting for M. A. M. A.

NEW YORK, Dec. 10—The Motor and Accessory Manufacturers' Association will hold a war meeting in Detroit Dec. 13 at 10 a. m. at the Hotel Statler. The directors of the N. A. C. C. have been asked to attend. The meeting will be addressed by the Automobile Industries Committee, and the meeting will be similar to that held by the N. A. C. C. Nov. 30.

Heavier Inventories Lessen Dividends

Need for Carrying Big Stocks of Materials Reduces Cash for Dividends

DETROIT, Dec. 7—There has been considerable uneasiness over the action of several motor companies in holding up, or decreasing certain dividends, but a little consideration of the conditions will indicate this to be an entirely natural action. At the present time every manufacturer requires a greater amount of cash on which to carry on his business—first because more is needed and secondly because money cannot be obtained as easily from the banks. Besides, capital is needed to finance war work.

There has been considerable uneasiness about the ability of the car manufacturer to get material for the coming year's production—and the one that was the uneasiest was the manufacturer himself. Hence iron-clad contracts were made with the sources of supply, and now the materials are coming in in great quantities.

Almost every company is carrying an inventory investment far above that of last year—which in turn has eaten into the surplus, and rendered the retention of dividends wise.

The recent report of the Reo Motor Co. is an example of the increase in inventory, and decrease in surplus. Dodge Brothers are reported to have material for over a year's constant production at maximum capacity, and Chalmers to have $6,000,000 worth of material on hand. Others are likewise carrying large inventories. In view of these conditions, conservatism is advisable, and is not necessarily an indication of weakness.

The Willys-Overland Co. reports twice as many sales for November as in November, 1916. The Cadillac Motor Car Co. states that out of a representative list of owners having previously owned Cadillacs, 37 per cent changed this season from open to inclosed cars. Buick, Olds, Reo, Oakland, Liberty, and, in fact, nearly all makers report good business.

Plan Canadian Trade Body

MONTREAL, Dec. 10—The Montreal Automobile Trade Association is planning to hold a convention of dealers, garagemen and repairmen during the Eastern Canada Automobile Show, Jan. 19-26. Efforts will be made to organize a Dominion Automobile Trade Association. The convention will be held Jan. 22, 23, 24.

Jobbers Get Winter Sticker

CHICAGO, Dec. 8—Stickers for promoting the Winter Business idea are to be furnished to members by the National Association of Automobile Accessory Jobbers. The Committee on Assisting the Trade plans to distribute thousands of these among members. The committee is already running constructive advertising in trade papers.

Plan Shell Syndicate of Detroit Makers

Automobile Industries Committee Working on Formation of Company

WASHINGTON, D. C., Dec. 10—One of the activities of the Automobile Industries Committee which has been taken up is that of the possible formation of a syndicate of Detroit manufacturers for the manufacture of ammunition, consisting of the larger sized shells. With this general thought in mind Messrs. Copland, Chalmers and Lee, constituting the committee, are going to Detroit on Thursday to meet many Detroit manufacturers and see if such an organization cannot be accomplished.

The plan is to get perhaps twelve or fifteen manufacturers from the industry to unite in forming a syndicate of $2,500,000. Each manufacturer may be asked to contribute $50,000 capital. The Government it is expected will assist in the syndicate to the extent of perhaps supplying a plant for the work. It is possible that some of the vacant Detroit factories, such as the Springfield Metal Body Co. or the unfinished Saxon plant, might be secured for such work.

The object of forming such a syndicate is that it would be possible in this way to take up the slack in many automobile factories with which the Government would perhaps not care to deal as individuals. The Government is not anxious to enter into small shell contracts and the formation of a syndicate of this nature would overcome the difficulty. It is possible that machinery to equip such a plant might be secured from different factories in the Detroit zone. There should not be any difficulty in getting workers for such an organization.

The Automobile Industries Committee is, through its corps of engineers, loaned by the automobile factories, familiarizing itself with the requirements of different Government departments so that it should soon be in an excellent position to give very complete information to those automobile factories that are looking for special Government work.

Reorganize Glidden Company

CLEVELAND, Dec. 11—The Glidden Varnish Co., Cleveland, which in the last fifty years has built up a large business with motor car, motor truck and latterly with airplane manufacturers, together with its subsidiary, the Glidden Varnish Co., Toronto, Canada, has been bought outright by a new corporation capitalized at $2,500,000, to be styled The Glidden Co. Adrian D. Joyce, formerly director and general manager of sales and distribution of the Sherwin-Williams Co., Cleveland, will be president. With him are associated O. A. Hasse, former manager of paint and varnish sales of the Sherwin-Williams Co., as vice-president, and R. H. Horsburgh, controller of the same company, as secretary and treasurer. All three have resigned from the Sherwin-Williams Co., and the new corporation will not be affiliated with any other paint and varnish interests. Members of the Glidden family, including F. A. Glidden, former president of the company, have resigned, but the remainder of the organization will not be changed. The present Glidden plant occupies nearly 17 acres and is one of the largest varnish plants in the country.

Reorganize National Defense Council

WASHINGTON, D. C., Dec. 9—As was foretold by the recent dispatch in AUTOMOTIVE INDUSTRIES telling of the resignation of the sub-committees of the Council of National Defense, the council has reorganized its expert advisory force which will counsel Government purchasing agencies in their expenditures of hundreds of millions of dollars. The personnel under the reorganization is:

Bernard Baruch, raw materials; H. L. Horning, automotive products; L. L. Summers, explosives; Eugene Myer, non-ferrous metals and cement; J. L. Replogle, steel; J. F. Guffey, oil; R. H. Downman, lumber; S. M. Vauclain, chief of section on production of finished products; Julius Rosenwald, chief of section on supplies of finished products; Walter Robbins, electrical equipment; C. E. Shatillon, small tools; G. E. Merryweather, machine tools; A. L. Scott, cotton duck; A. W. Lawrence, shoes; A. C. Brown, locomotive cranes; A. D. Edington, wool; C. Eisenman, fabrics. Many of these men, serving in the past as advisers with nominal salaries, will continue on that basis.

Ball Bearings Discussed by Indiana Section

INDIANAPOLIS, Dec. 10—The case for the ball bearing as against other forms of journal was presented by S. W. Gurney, Gurney Ball Bearing Co., in a paper read last night to the Indiana section of the S. A. E. Gurney covered the subject from the theoretical viewpoint chiefly. He pointed out that both ball and roller bearings have an area of contact when under load, instead of the point or line contact which they possess in theory. He also laid stress on the difficulty in roller bearing making of maintaining the rollers strictly parallel and said that flexibility within the roller as obtained with one type was a factor in increasing the life. Accuracy is, of course, the main thing in making bearings for long life whether of the ball or the roller variety and Gurney stated that ball production had now been brought to a pitch of perfection where the errors were to be measured by merely a few hundred thousandths of an inch.

Mitchell Heads Maxwell

DETROIT, Dec. 12—Ledyard Mitchell has been elected president of the Maxwell Motor Co., and Walter Flanders, the general manager, has been made chairman of the board of directors, to succeed Eugene Myers, retired. There will be no change of the policy of the company.

S. A. E. Now Has 2,882 Members

List Increased 800 in Last Year —Glover Resigns From Tractor Division

WASHINGTON, D. C., Dec. 10—At the regular monthly meeting of the Society of Automotive Engineers held at society headquarters in the Munsey Bldg. to-day the resignation of Fred H. Glover of the Emerson-Brantingham Co., tractor manufacturer, as a member of the Tractor Standards Division was accepted. Mr. Glover is entering the Ordnance Department and it is expected will receive a Major's commission. His successor has not been appointed.

The membership report shows that the society's roll at present numbers 2882, and that during the past fiscal year ending Nov. 1, 800 new members were added. During that time applications for membership from 1455 were received, but many of these have not qualified due to many entering the service.

The Council voted favorably on adopting smaller sizes of S. A. E. pins for members to wear in button holes. Two sizes smaller than the present one were adopted. The design is identical, but one size is very much smaller and the other perhaps one-quarter smaller than the present.

Represented at International Conference

It is expected that the society will have one or two members who will attend the International standardization conferences in London which will be held the latter part of January. A complete schedule of those who attended has not as yet been drafted.

The next meeting of the council, and the last of the present council, will be held at headquarters, New York City, Wednesday, Jan. 9.

The Meetings Committee reported that to date 470 tickets have been sold for the Automotive Industries dinner at Hotel Biltmore, New York, Jan. 10, and 346 tickets have been sold for the War dinner at the New Morrison Hotel, Chicago, Feb. 1.

After the meeting of the council the third of what is known as the council dinners was held at the University Club. These dinners are not a part of the council work, but are intended to broaden the work of the society by having present many non-members engaged in Government activities.

The dinner was enlivened by a discussion of the subject of education of unskilled labor in factories and the education and substitution of women laborers.

Major Moody of the Ordnance Department gave a very comprehensive outline of the requirements of men needed for that department. Director Smythe of the U. S. Public Service Reserve gave a complete survey of the work that organization is doing in furnishing skilled workers for those Government departments requiring same.

S. A. E. Discusses Tractor Tests

Standardized Rules for Tests Proposed, but Are Not Likely to Be Formulated Yet

MINNEAPOLIS, Dec. 6—At a meeting held here at S. A. E. headquarters rules for tractor contests were discussed in an informal way. It has been proposed that the S. A. E. formulate a set of rules for tractor tests along the same line as its regulations for official fuel economy and acceleration tests, but to judge from the discussion this evening, the consummation of this plan is still a long way off.

On the occasion of a previous meeting of the Minneapolis section for the same purpose a general invitation was sent out to all local tractor makers to attend, and it developed that there were about as many different opinions as to what a practical tractor contest should be as there were tractor men present, with the result that it was impossible to get anywhere. The meeting, therefore, was limited to members of the sub-committee on test regulations and one or two others. Some enlightening remarks were made by Prof. L. W. Chase of Nebraska State University, who acted as judge at several of the Winnipeg contests and recently made extensive tests of various makes of tractors on the university experimental farm.

One difficulty in holding a large contest is that it is almost impossible to get a field sufficiently large for the purpose where the plowing conditions are substantially uniform. Also, if traction dynamometer and brake tests are to be made, apparatus will be required, the cost of which will run into thousands of dollars. Furthermore, it would be necessary to have a dependable observer for each tractor. While the S. A. E. could formulate regulations, it does not appear to be within its field to conduct the contest, and no definite plans as to what organization should have charge of the contest seem to have been arrived at. It is of the highest importance that some strong organization should be back of the affair, which could compel compliance with the regulations by its powers of disqualification and suspension. The American Society of Agricultural Engineers has been mentioned in this connection, but it is doubtful whether it would consider the proposition.

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Trucks Coming from Decatur

DECATUR, ILL., Dec. 10—The Masterbilt Truck & Tractor Co., Decatur, Ill., has been incorporated with a capital stock of $100,000, to manufacture farm tractors, ambulances, hearses, and motor cars. Frank L. Suffern is president; H. L. Suffern, vice-president; and L. E. Davis, secretary-treasurer. In a short time, it is planned to increase the capital stock to $250,000. The company will be located temporarily at 437 North Water Street. Later, land will be purchased near Decatur and a factory building erected.

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Philadelphia Branch for Ahlberg

PHILADELPHIA, Dec. 12—Following the closing of the Philadelphia branch of the Hess-Bright Co., the Ahlberg Bearing Co., Chicago, will open a branch at the old Hess-Bright location and will represent the Hess-Bright Co.

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Munitions Work Ready for Makers

WASHINGTON, D. C., Dec. 10—The Automobile Industries Committee has 7000 complete gun site assemblies approximating $3,000,000 worth of business to be distributed to manufacturers. Deliveries are to start in 3 months, and material used is to be bronze and steel. The committee has blue prints of this work on hand and suggests that manufacturers desiring such work, which is a tool room job, get in touch with it at Washington.

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Barley Using Duesenberg Engine

KALAMAZOO, MICH., Dec. 10—The Barley Motor Car Co. is the first user of the new Duesenberg engine, which is fitted to the 6-90 models for 1918. The price of this car, with a 6-passenger touring body is $3,150. The following is the revised price list on Roamer models:

Model 6-54

4-passenger touring	$2095
2-4-passenger roadster	2295
Town Body	3250
Standard Sedan	3250
Touring Sedan	3250

Model 6-45

4-passenger touring	$1950
2-4-passenger roadster	2150
Town Body	3150
Standard Sedan	3150
Touring Sedan	3150

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Double Wright-Martin Production

NEW YORK, Dec. 10—In the last three months the Wright-Martin Corp. has doubled its daily production of airplane engines and for several weeks has been averaging 10 engines daily. This output will be further increased when present plant facilities, which are being rushed, are finished. It is expected that November will be the first month in which a substantial net earning power can be shown. The company is working on one order for the United States, all contracts being on a cost plus basis.

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Champion Convention Dec. 17

TOLEDO, Dec. 12—Members of the sales force of the Champion Spark Plug Co. are assembling in Toledo for their annual sales convention. They will be the guests of the company for the week beginning Dec. 17.

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DETROIT, Dec. 7—The Detroit Lubricator Co. is to erect a storage building at 1178 Trumbull Street, to cost $5,250.

Dealers Asked Help in War Problems

Cities Send Men to Confer With Automobile Industries Committee at Capital

NEW YORK, Dec. 10—Leading automobile dealers have been asked to go to Washington Dec. 14 to meet with the Economy Board of the Council of National Defense. Boston, Chicago and other city-dealer associations will send representatives. President George W. Browne, Milwaukee, will represent the National Automobile Dealers' Association.

BOSTON, Dec. 8—The Boston Automobile Dealers' Association at a special meeting of the board of directors to-day appointed President John H. MacAlman and John H. Johnson a committee to go to Washington to confer next Friday with A. W. Copland, of the Automobile Industries Committee. That the conference will have to do with giving dealers some recognition at Washington seems certain, for conferences have been held with Senator Weeks of Massachusetts, and he promised to do all he could to see that the men selling cars could present their claims through the proper channels. Also to be considered, it is believed, will be the question of how best to secure skilled workers from the factories and service stations without disturbing the working forces. Johnson has outlined such a plan to Senator Weeks, and the latter turned it over to one of the defense sub-committees.

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Scrap Useless Farm Implements

WASHINGTON, Dec. 12—The Department of Agriculture is advising farmers to scrap all worn-out machinery at the first opportunity, that room may be made either for the purchase of new machinery or for the installation of repairs to that which is capable of being repaired.

The Department suggests, first, the removal of all bolts or other parts which might be useful in repairing other equipment. Then it adds: "It is usually false economy to attempt to use a worn-out machine as the time wasted with breakages and other delays and the extra power required for its operation usually more than offset the saving effected by continuing it in use"

—

Investigate Trade Acceptance

NEW YORK, Dec. 12—The credit men of the accessory jobbing houses in New York, Brooklyn and Newark and two from Philedalphia met at Hotel Astor last evening to consider the adoption of the trade acceptance as a business practice. The trade acceptance was explained by E. B. Heyes of W. & J. Sloane, a large New York wholesale house, after which a committee was appointed to ascertain the best method of using the acceptance. About 60 men were present.

Maibohm Light Six New Model

Four Body Styles Available—Prices from $975 to $1,375

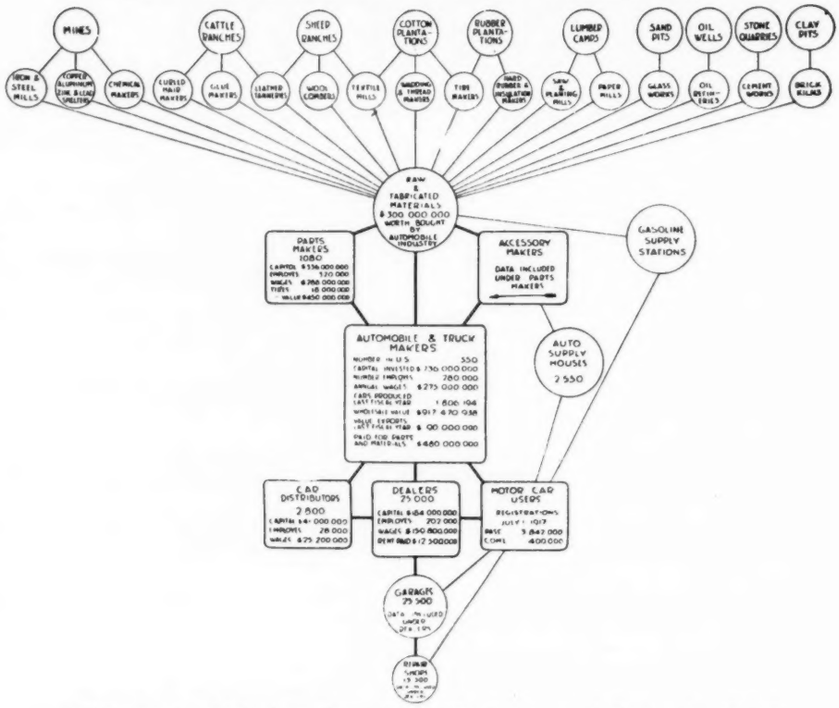
RACINE, WIS., Dec. 8—A light six-cylinder chassis with two open and two closed body models has been added by the Maibohm Motors Co., Racine, Wis., to the four-cylinder runabout. There is a four to five-passenger sport phaeton with wide doors, double cowl and straight line body at $975; a sport roadster with a large luggage compartment, at the same price; a touring sedan with permanent top and disappearing sides, and a sport coupe, both selling for $1,375.

The engine is a six-cylinder Falls, 3⅛ by 4¼ in. Valves are 1½ in. diameter by 13/32 lift and are readily adjusted at the cylinder head. The crankshaft is a 2¼ in. Wyman-Gordon of chrome nickel steel counterbalanced. Lubrication is by a cam operated piston pump to main bearings with splash to cylinders and front gears. Cooling is by thermo-syphon.

The carbureter is a Stromberg fed by a Stewart vacuum system from a 14-gal. tank in the rear. Ignition is by Atwater Kent with hand in vamp, the unit being mounted on the left rear jack of the crankcase and driven from the camshaft direct. Starting and lighting is supplied by a Wagner 6-volt, two unit system with Bendix drive for the starter and generator driven through the front gear case. A Willard storage battery is supported in a steel cradle under the front board.

The engine is in unit with a Borg & Beck dry plate clutch and a Mechanics three-speed gearset, the gears being S. A. E. nickel steel specification No. 2340, 7-9 pitch, ¾-in. base 20 deg. involute. Gearshift and hand brake control are in the center and have overhung levers within easy reach of the driver. Two 4½-in. universals and a tubular propeller shaft take the drive to a floating Currew axle. Front springs are semi-elliptic 36 by 1¾ in. and rear springs 49 by 1¾ in. semi-elliptic underslung. Artillery wood wheels with demountable rims and one spare with carrier, Goodyear tires 32 by 3½ with straight sides are used. The wheelbase is 115 in. and the weight of the touring model is said to be 2407 lb. The top is black or kahki and the curtains open with the door. The upholstery is long grain semi-bright finish with French cleet. The speedometer is a Stewart, worm driven from the transmission case.

How the Motor Car Industry Is Organized



This chart, which shows how closely the motor car industry is related to many other primary industries, has been prepared by the National Automobile Chamber of Commerce. Even the conservative figures given make plain the tremendous importance of this industry to the other industries

Standardize Many Tractor Details

(*Continued from page 1041*)

It had been suggested to adopt for tractor carbureters flanges of the same dimensions as used for the next size larger gasoline carbureter, but this suggestion was not approved. It would have introduced considerable difficulties in the service problem, and, besides, there seemed to be no occasion for enlarging the flange and changing the bolt centers.

The plan is to simply thicken the flange and the matter was referred to a committee composed of Messrs. Bennett, Buffington and Wiley, with the suggestion that a representative of the Waukesha Motor Co. also be appointed to the committee, as some of the complaints had come from that concern.

Prof. Moyer of Minnesota University made verbal report of some tests made by him regarding the resistance to rolling on soft ground. His experiments were made in the basement of one of the buildings of the institution, which was covered with soil to a depth of 8 in. Tests were made at first at a uniform speed of 20 ft. p. m. The results obtained with different weights on the wheels, resulting in different depths of penetration, could be expressed quite accurately by a simple formula, but it was found that when the speed was increased the resistance also varied, and, contrary to expectation, it increased with the speed, which is probably due to wave action, as in ship motion. The experiments are to be continued.

Prof. Young of Purdue University, who was present, said that the Purdue Research Laboratory wanted to do some work of use to the tractor manufacturers. They had the men, the equipment and the means to carry on this work and wanted to be told what problems required investigation. They had been making quite an extensive investigation of carburetion and manifolding.

Owing to the fact that the division has under consideration numerous subjects on which no definite action could be taken at this meeting, it was decided to call another meeting, to be held at the New York headquarters of the Society on Jan. 8 at 9.30 a. m. This is the day before the winter meeting of the Society, and it will give the division a chance to get reports on a number of subjects ready for presentation to the Standards Committee at the winter meeting.

Plan Post-War Work for Airplanes

Will Carry Mail and Freight—Locate Ships in Distress—Map United States

WASHINGTON, D. C., Dec. 11—Mail and freight carrying, the location of vessels in distress at sea, the destroying of derelicts menacing navigation, and the mapping of the United States are some of the duties to which the Government through the Civil Aerial Transport committee plan to put airplanes after the war.

In a statement issued to-day, the committee said the future of aviation is of vital importance because upon it depends the "possibility of salvaging the present investment in aviation expressed in terms of human energy, skilled workmen, trained aviators, time and capital."

Post-War Conditions

"Peace," says the statement, "will find this country with an immense air capital on hand and comprising skilled workmen, factories, machinery and industrial organization in effective operation and this capital must be so conserved and directed that if possible not a man or a dollar will be wasted in the hiatus between war and peace."

The statement shows that planes have already been built to carry 25 passengers at a speed of 150 m.p.h. and with ascension power of 4½ miles, and tells that France, England, Bavaria and Germany have already planned aerial traffic systems when war ends. Bavaria has outlined a system for Central Europe and Germany—a Hamburg to Constantinople route.

Congress, adds the statement, has appropriated $100,000 for the initial steps in aerial mail delivery and the War Department has agreed to turn over to the Postoffice all airplanes not suited for further military work.

The committee will soon draw up plans for airdromes, quarters, personnel, etc., for aerial mail service, and will also lay out rules of the air, define rights of landing and map out air currents, designate landing places and so forth. It will also take up international questions regarding customs, ports of entry and other matters intimately related to these subjects.

Congress, according to the statement, has authorized 10 coast guard air stations which will start active service as soon as the men are trained and the airplanes built.

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No Shortage of Alcohol

MILWAUKEE, WIS., Dec. 8—Fears that the nation faces an acute shortage of alcohol are scouted by officials of the Milwaukee Drug Co., a large manufacturer and wholesaler of drugs, chemicals, etc. It is stated that prospects are for a larger supply than ever before, due to the fact that distilleries now are making large quantities of denatured alcohol. The Milwaukee house also says that it has experienced no difficulty in filling the demands of all of its customers up to this time, and anticipates no trouble in being able to make all deliveries desired for some time to come. Demands for denatured alcohol by motorists are reported to be the heaviest ever known, due to the growth of winter driving and the use of closed cars.

Labor Conscription Not Likely

Secretary Wilson Plans to Recruit 150,000 Men for Shipyards Work

WASHINGTON, D. C., Dec. 11—Conscription of labor, Secretary of Labor Wilson stated is not likely to be necessary for winning the war but he suggests should it become necessary the Government should conscript industries also. His statement showed that there is now an impending call for no less than 150,000 workers skilled at various trades and involving over 30 mechanical trades to serve in the various shipyards engaged in building ships for the shipping board.

As yet there are comparatively few women—only about 300—called to take the places of men. These are mainly in the scientific instrument shops where delicate work is required. The statement says that factories making gears and other machinery for passenger cars are laying off workers, while makers of trucks and other service machines are calling for more labor.

One Elmira firm not in the scheduled list has substituted 400 women for men and asks for 1100 more but has met with a vigorous protest from labor unions because of lower wages reported to be paid the women.

At this time there appears to be more labor unrest among plants engaged in war work than where the plants are otherwise engaged, labor apparently thinking war work firms are making excess profits and trying by unrest to share them through increased wages.

Automotive Securities Quotations on the New York Exchange

	Bid	Asked	Net Ch'ge
*Ajax Rubber Co.	47	50	—1
*J. I. Case T. M. Co. pfd	..	78	..
Chalmers Motor Co. com	2	4	..
Chalmers Motor Co. pfd	..	50	..
*Chandler Motor Co.	63	64	—2
Chevrolet Motor Co.	62	64	—3
*Fisher Body Corp. com	20	34	..
*Fisher Body Corp. pfd	75	80	..
Fisk Rubber Co. com	..	45	..
Fisk Rubber Co. 1st pfd	98	103	..
Fisk Rubber Co. 2nd pfd	60	70	—10
Firestone Tire & Rubber Co. com	97	100	..
Firestone Tire & Rubber Co. pfd	97	100	..
*General Motors Co. com	87	88	—2
*General Motors Co. pfd	74	75	—1
*B. F. Goodrich Co. com	35	37	..
*B. F. Goodrich Co. pfd	93½	97	..
Goodyear Tire & Rubber Co. com	144	148	+1
Goodyear Tire & Rubber Co. pfd	97	99	+1
Grant Motor Car Corp	2	3	..
Hupp Motor Car Corp. com	2	3	..
Hupp Motor Car Corp. pfd	74	79	..
International Motor Co. com	11	15	..
International Motor Co. 1st pfd	30	50	..
International Motor Co. 2nd pfd	20	25	..
*Kelly-Springfield Tire Co. com	39	41	..
*Kelly-Springfield Tire Co. 1st pfd	75	80	—2
*Lee Rubber & Tire Corp	13	14	..
*Maxwell Motor Co., Inc., com	26	27	—1
*Maxwell Motor Co., Inc., 1st pfd	55	56	..
*Maxwell Motor Co., Inc., 2nd pfd	20½	22	+3
Miller Rubber Co. com	125	130	+10
Miller Rubber Co. pfd	95	98	—1
Packard Motor Car Co. com	110	118	..
Packard Motor Car Co. pfd	92	96	..
Paige-Detroit Motor Car Co	10	12	—4
Peerless Truck & Motor Corp	11	12½	—1½
Portage Rubber Co. com	109	114	+4
Regal Motor Car Co. pfd	10	20	..
Reo Motor Car Co.	15	17	—2
*Saxon Motor Car Corp	6	8	+2
Springfield Body Corp. com	..	..	..
Springfield Body Corp. pfd	..	..	..
Standard Motor Construction Co	9	10	— ½
Standard Parts Co	..	75	..
*Stewart-Warner Speed. Corp	46	48	..
*Studebaker Corp. com	42	43	—3½
*Studebaker Corp. pfd	..	95	..
Swinehart Tire & Rubber Co	19	20	—3
United Motors Corp	15	15½	—1
*U. S. Rubber Co. com	49	50	—3½
*U. S. Rubber Co. pfd	95½	97	..
*White Motor Co	36	38	..
*Willys-Overland Co. com	18	19	—1
*Willys-Overland Co. pfd	70	71	..

*At close Dec. 8, 1917. Listed N. Y. Stock Exchange.

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

	Bid	Asked	Net Ch'ge
ACTIVE STOCKS			
Auto Body Co	..	8¾	..
Bower Roller Bearing Co	..	23½	..
Chevrolet Motor Co	63	65	—2
Commerce Motor Car Co	..	..	..
Continental Motor Co. com	5⅜	5½	+ ⅛
Continental Motor Co. pfd	85	..	..
Edmunds & Jones Co. com	20	26	..
Edmunds & Jones Co. pfd	..	..	..
Ford Motor Co. of Canada	144	150	—10
Hall Lamp Co	..	..	..
Michigan Stamping Co. com	..	..	..
Motor Products	..	..	..
Packard Motor Car Co. com	108	117	..
Packard Motor Car Co. pfd	92	..	..
Paige-Detroit Motor Car Co	12	12⅝	—1¼
Prudden Wheel Co	10¾	12	..
Reo Motor Car Co	16	16½	—2⅝
INACTIVE STOCKS			
Atlas Drop Forge	..	32	..
Kelsey Wheel Co	20	88	..
Regal Motor Car Co	..	26½	..

N. Y. to Hartford Motor Mail Route

Bids Out for Automobile Mail Service to Reduce Rail Carrying

NEW YORK, Dec. 11—The United States Government will establish a motor mail route between New York and Hartford, via Waterbury, Danbury and White Plains. Bids are to be received before Feb. 1. The schedule requires motor trucks carrying mail bags to leave New York and Hartford at 5:30 a. m. daily, and make the trip of 105 miles in less than 10 hours. The truck drivers will sell stamps, receive and deliver registered matter and take care of the registry of mail along the route. The contracts are to run until June 30, 1921, and the contractors are required to furnish bonds of $20,000.

Exempt Engineering Students

WASHINGTON, Dec. 10—Engineering students in schools recognized by the War Department will be exempt from the selective draft. It is estimated that 6000 students are affected. By an order of General Crowder such students are placed in the same class as medical students and will receive preferred classification.

Electric Railway War Board

WASHINGTON, D. C., Dec. 3—A war board has been named by the American Electric Railway Association to co-operate with the Government and particularly with the other committees on transportation. Arrangements are contemplated whereby there may be an exchange and interchange of traffic between electric lines, railways, motor trucks and waterways.

Reo Distributers Convene

DETROIT, Dec. 12—About 100 distributers of the Reo Motor Car Co. met at Lansing on Monday and Tuesday of this week, and with the sales department discussed business conditions and interchanged ideas. The freight car situation was of most pertinent interest, as the present shortage in transportation facilities is handicapping both manufacturers and dealers. For this reason, and because it is expected that Government control of railroads will tighten up in January, drive-away plans and methods were discussed and work started on a more definite drive-away system. A shipping schedule for the period from Jan. 1 to Aug. 1, 1918, was also discussed.

Rubber Imports Centralized

(*Continued from page 1062*)

To import rubber, scrap rubber or kindred products the American manufacturer or importer instructs the foreign supplier to ship to the Rubber Association of America, marking the consignment so that the association may notify the purchaser of its receipt.

The association will have representatives at New York and San Francisco and the importer will have to send to them the bills of lading, etc., together with his guarantee made out on a form obtainable from the War Trade Board. When these regulations are complied with the association will release the consignment and it will go forward to the importer.

There are four classes of importer. First a manufacturer who imports direct, second an importer working in conjunction with a manufacturer, third an importer of scrap or reclaimed rubber, and fourth an importer alone. For each of these there is a different guarantee form, but the provisions are in the main the same and have the one object of preventing unlicensed exportation.

In the case of the association's representatives being dissatisfied with the evidence placed before them by the importer and so refusing to release a consignment, it is stipulated that the dispute be referred to the War Trade Board for whom and under whose instructions the association is acting.

To prevent undue delay in delivery of consignments to manufacturers or others there is a provision whereby release may be given before the receipt of bills of lading which are frequently received after the shipment.

Abbot - Hal Merger Settled Dec. 14

Preference Stockholders Withhold Consent for Week's Consideration—Others Agree

CLEVELAND, OHIO, Dec. 7—At a meeting of the Abbot Motor Car Co. stockholders held here to-day the common stockholders approved the suggested merger with the Hal Motor Co. The preference stockholders withheld their decision until another meeting to be held Friday, Dec. 14. If the merger does not go through a receiver will probably be appointed.

Reduce Parker Patent Valuation

DETROIT, Dec. 12—Clark W. Parker, president of the Parker Rust Proof Co., and W. C. Parker, his son, have been ordered by the Michigan Securities Commission to reduce their stockholdings for patent rights from $1,059,000 to $850,000. All but $300,000 of the $2,300,000 capitalization is outstanding and Parker must give the company a two-year note for $90,700 at 6 per cent as a lien against the $850,000 in stock now held by the State. Return stock now amounting to about $200,000 is taken into the company's treasury and an issue of about $100,000, short term note, is to be made so that the company may conduct business.

"Flame of Liberty" for N. Y. Show

NEW YORK, Dec. 12—Shields representing the "Flame of Liberty" upholding the flags of the allied nations will be used to decorate the pillars on the main floor of the Grand Central Palace during the New York Show, which will be held Jan. 5-12. The lattice work and plaster cast of former years will be entirely replaced by mural paintings. The windows on the main floor will be curtained with materials of a tapestry-like appearance.

J. R. Signmore is manager of the Studebaker Corp. interests in Vancouver, B. C.

Reo Assets and Liabilities

DETROIT, Dec. 7—The following is a condensed statement of the assets and liabilities of the Reo Motor Car Co. at the close of the business Aug. 31, 1917, as shown by a general report of audit dated Nov. 30, 1917, issued by the J. J. Jerome Co., public accountants:

Liabilities

Current Liabilities		$2,883,821.11
Notes Payable	$950,000.00	
Account Payable	1,619,444.24	
Accrued Pay Roll	190,637.73	
Reserve for Taxes	83,692.59	
Miscellaneous Reserve	40,046.55	
	$2,883,821.11	
Capital		11,584,165.16
Capital Stock Authorized	$10,000,000.00	
Less Unissued	3,062,750.00	
	$6,937,250.00	
Surplus	4,645,915.16	
	$11,584,165.16	
		$14,467,986.27

Assets

Current Assets			$8,836,922.64
Cash on Hand and in Banks		$172,792.17	
Receivables		1,122,448.98	
Notes Receivable	$108,800.00		
Acct. and Drafts Rec'ble.	913,612.26		
Liberty Bond Subscriptions.	165,536.50		
	$1,187,948.76		
Less Reserves	65,499.78		
	$1,122,488.98		
Inventories		$7,541,681.49	
		$8,836,922.64	
Capital Assets			5,488,923.00
Land		$273,148.43	
Buildings		1,452,495.28	
Machinery and Equipment		3,763,279.29	
		$5,488,923.00	
Deferred Charges			19,353.13
Interest in Branches			122,787.50
			$14,467,986.27

England Organizes Deliveries

Will Centralize Systems for Despatching Goods from Stores to Homes

LONDON, ENGLAND, Dec. 10—Following a general scheme for the Government organization of road traffic, it is now announced that the Ministry of Munitions will develop a plan whereby the majority of trucks and even horse vehicles used in delivery will be brought under a co-operative control administered by the ministry. The idea is that every vehicle should carry always the nearest approach to 100 per cent load.

This organization for stores is as yet only planned, but for larger loads a similar system has for some time been in use in various parts of England. In this a manufacturer with goods to be moved applies to the ministry for trucks. The officials in charge will find another firm wanting service near the delivery point for the first manufacturer. They will then send trucks, charging standard rates per hour, will deliver the goods, reload on the next order and so on. This cuts down the idle mileage to a minimum.

At present there is no compulsion placed upon traders to employ the ministry's services, but it is hinted that legislation may be expected.

Rheinhard Takes on Gray & Davis

BOSTON, Dec. 10—Rheinhard Bros. Co., Minneapolis, has been appointed sole distributor of Gray & Davis starting and lighting systems, for Fords, in the territory embracing Northern Wisconsin and North and South Dakota.

Detroit Starter Becomes Versal

DETROIT, Dec. 5—The Detroit Starter Co. is now styled the Versal Products Co. For some time the company has given its products the trade name "Versal." The former name was a misnomer, as the company has discontinued the manufacture of starters.

Ford Appeals Decision

DETROIT, Dec. 7—The Ford Motor Co., through its attorneys, has appealed to the State Supreme Court from the decision which Circuit Judge Hosmer recently rendered. By this decision, the Ford Motor Co. must distribute over $19,000,000 of undivided dividends.

Bumper Association Dissolved

NEW YORK, Dec. 10—The Automobile Bumper Association, formed about a year ago by the principal manufacturers of bumpers, has been dissolved by the consent of the manufacturers to a decree of the United States District Court for the Southern District of New York. The association was concerned with the pooling of patent rights and price regulation. The corporations mentioned in the decree are: Gemco Mfg. Co., Central Brass & Fixture Co., Emil Grossman Mfg. Co., J. H. Sager & Co., Inc., Cox Brass Mfg. Co., Milwaukee Auto Engine & Supply Co., L. P. Halladay Co., American Brass Co., Auto Compressor Co., U. S. Auto Bumper Co. and Auto Parts Mfg. Co.

Shaler Adds a Lens

WAUPUN, WIS., Dec. 10—The C. A. Shaler Co., long known in the vulcanizer field, has entered a new and entirely different field. It has obtained the sole selling rights for a new type of headlamp lens which is to be marketed under the style Shaler Roadlighter. The lens is made of molded optical glass, smooth on the front and having a series of prisms on the back which deflect all projected light so that it does not rise higher than 42 in. above the road, and also illuminates at the sides as required by the lighting laws in various States. Various sizes will be made, those for Ford selling at $2.75 and for all other cars at $3.50. The addition of the Roadlighter does not mean that the vulcanizer business will be curtailed; on the contrary it will be practically doubled in 1918.

Schipper to Talk on Design

CLEVELAND, OHIO, Dec. 8—At the meeting of the Cleveland Section of the Society of Automotive Engineers to be held here Dec. 21, J. Edward Schipper, Detroit editor of The Class Journal Co., will talk on what the public is demanding from the automobile engineer. Special reference will be made to the effects of the war on automobile design, and it is expected that there will be considerable discussion along the lines of proposed methods of lightening the weight and improving the performance of motor and chassis. The place at which the meeting will be held will be announced later.

National Automobile Accessory Jobbers' Meeting

In several issues of AUTOMOTIVE INDUSTRIES the date for the New York meeting has been given as February 11-16, which is a typographical error. These dates are January 11 and 16. Committee meetings will be held January 11 and 12 at the Hotel Astor and the general sessions of the association Monday, Tuesday and Wednesday following the show—January 14, 15 and 16.

General Motors Work for Industrial

ST. JOHNS, MICH., Dec. 10—The Industrial Foundry Co. has secured substantial contracts with the General Motors Co., and is stated to have enough work booked for six months' operation. Since May, one addition 40 x 105 ft. another 32 x 35 ft., and another 20 x 30 ft. have been completed, and further expansion is planned. At present the capacity of the plant is 10 tons of metal daily.

Homes for Workers Plentiful

No Shortage in Detroit at Present—Demand for Skilled Workers Strong

DETROIT, Dec. 7—Reports filed with the police department show that in spite of the great exodus from the city caused by enlistment in government service, and the movement of entire families, more families are coming into the city than are leaving. This is in direct contradiction to reports stating that many houses were now empty, due to laying off men in the factories, as contrasted with the house shortage of last spring. The factories are not laying off men—that is, skilled men. There is a premium on skilled mechanics, cost-study men and time keepers. The turnover in unskilled labor is somewhat higher, due to the fact that factories are getting on a war basis.

Many houses are available, but that is explained by the fact that families are now doubling up, and making one house do for two. The draft has taken thousands of men—men who were running their own houses, and the families they supported have joined relatives in the city or elsewhere.

Building has decreased owing to the fact that the banks are not so freely financing real estate as formerly, because money is tighter, or being directed in other directions. But all signs point to the greatest industrial activity the city has ever seen, because of the large war orders, and because of the fact the automobile industry is not to be seriously curtailed.

Winternitz Buys Detroiter

DETROIT, Dec. 10—Samuel L. Winternitz & Co. have purchased from the receiver the entire stock of finished cars, machinery, tools, parts and good-will of the defunct Detroiter Motor Car Co. The entire property will be disposed of at auction within 30 days. In the meantime the service department will be reorganized and continued.

Ampeco Places Exclusive Sales Agent

MARSHALLTOWN, IOWA, Dec. 10—The American Machine Products Co. has appointed the Fulton Sales Co., 910 South Michigan Boulevard, Chicago, as exclusive agent for its products, which are Ampeco pistons and accessories for Fords.

Concessions to Lyons Fair Importers

NEW YORK, Dec. 9—The utmost consideration to all requests for the importation of goods sold through the medium of the Lyons, France, sample fair, March 1, 1918, will be given by the French Foreign Office, according to a cablegram. In view of the present French regulations requiring licenses for practically all imports into France, any concessions which the Foreign Office may have in view will be of service to American exporters.

Industrial Review of the Week

A Summary of Major Developments in Other Fields

A New Service

Herewith AUTOMOTIVE INDUSTRIES *supplies for the benefit of its readers a general summary of important developments in other fields of business. This is rendered possible by the editorial co-operation of leading industrial publications which are recognized authorities.*

By compressing the general industrial situation into this form we hope to give our readers a clear and comprehensive idea of up-to-the-minute developments which they could otherwise secure only with considerable expenditure of time and effort.

ANTHRACITE PRODUCTION FAVORABLE

The production of anthracite during the past week was as heavy as could be logically expected under the circumstances. For the first time in the history of the industry the operators were able to induce their employees to work on Thursday, Thanksgiving day. It was, of course, impossible to induce all employees to work, but a sufficient number answered the call of their country to enable many collieries throughout the region to operate to almost full capacity. This is in many respects a pointed answer to those who have recently, in certain publications of the country, taken the opportunity of maligning the coal industry on the ground of a lack of patriotism. An advance of 35 cents per ton on the domestic sizes of anthracite was recently granted by the Coal Administrator. This advance was to cover certain increases in wages made to the mine workers. It of course immediately affected the retail prices of this fuel throughout the country. While conditions in the anthracite trade are still unsatisfactory and to a considerable degree strained, yet the stress is perhaps not quite as great this week as it has been during some weeks in the past. If the United States Congress acts upon the recommendation of the President contained in his recent address to that body and declares war upon Austria-Hungary, with the internment of unnaturalized citizens of that monarchy, it may to a decided degree adversely affect the production of anthracite. Anthracite mine workers are to a large extent foreign born, and it has been estimated that nearly one-quarter of their number owe or have owed allegiance to Austria-Hungary.

Transportation still remains the big problem confronting the fuel industry of the land. During the past week the supply of cars to the mines throughout the bituminous regions has almost without exception been well below requirements. The working of one to four days per week throughout the mining regions is neither conducive to a large output of coal nor to happiness and contentment among the miners. In the Pittsburgh region several blast furnaces have been obliged to shut down in addition to those already out of operation on account of lack of fuel. With the closing of lake navigation and the coming of winter, it is anticipated that a considerable number of locomotives and cars which have been used for the transportation of iron ore in the Northwest may be transferred to the coal regions to help out a lack of motive power and rolling stock there. It is estimated that something like 450 locomotives might be transferred from the Lake Superior region for this purpose during the coming winter. While this would hardly be an adequate supply to relieve the present scarcity of motive power, it will doubtless help to a considerable degree. The pooling of the coal of the Pittsburgh and West Virginia regions and the avoidance of cross-movements of coal will also do much to relieve the situation.—*Coal Age.*

METAL MARKET CONDITIONS

The Washington conference between the Government and steel makers and the more serious turn in the railroad situation due to snow and zero weather have largely occupied the iron and steel trades and business has been secondary.

Contrary to expectation, the Washington meeting was called with no definite proposal in the minds of the Government representatives. There was no discussion of specific prices, but the situation was canvassed with reference to the latest data obtained from the manufacturers by the Federal Trade Commission showing increased cost of production. The commission's findings will now be gone over with the manufacturers at Washington Dec. 14, and later the War Industries Board will appoint a meeting with the Steel Committee before Jan. 1. Indications are that few, if any, changes will be made in the present price schedule, and that it will continue after Jan. 1.

Consumers Cautious Buyers

The pendency of the Pomerene bill for full Government control of the steel industry figures largely with the Government's representatives as a reason for not disturbing the market at this time, though a portion of the Federal Trade Commission still favors reductions in basic products.

With no authority which can give assurance of stable prices, consumers are cautious in buying. This is true particularly in lines of product in which Government wants are not dominating. As to plates, shapes, bars and forging steel the average buyer appreciates that contract deliveries are entirely subject to war priorities.

Saturday's blizzard made havoc of the plans of the general operating committee of Eastern railroads at Pittsburgh. A better movement of coke had helped Youngstown blast furnaces to start up, but the coal situation again became desperate. At Cleveland wire plants of the American Steel & Wire Co. have been shut down since Saturday for lack of coal, five blast furnaces being banked.

Specifications for Government steel are going to the mills faster than had been counted on, and some classes of mills are more fully occupied on war account than seemed likely two months ago. Yet there are gaps due to lack of team work. For example, Canadian plants having contracts for American shells complain of the slowness with which orders for the steel are sent out from Washington to the makers here.

The pig iron market is working steadily toward a condition in which consumers without war orders will find it wellnigh impossible to secure iron. Philadelphia continues to lead in the volume of new buying. About 60,000 tons was bought there in the week, 30,000 tons being basic for delivery over the first half of 1918. For Pencoyd, Pa., and Worcester, Mass., steel works it is expected that basic iron will be brought from Alabama furnaces of the Steel Corporation.

Pittsburgh and Valley steel works, unable to buy pig iron to make up shortages, are using more scrap, but even so the steel ingot output is only 75 to 80 per cent of capacity, and the ingot output for the year is now estimated at 42,600,000 tons, as against 41,400,000 tons last year.

Hundreds of thousands of tons of steel for Europe are held up at Atlantic ports and elsewhere by freight congestion. For Italy alone 82,000 tons is awaiting steamers at one port.

In wire products sales are being made to the manufacturing trade for delivery in the first quarter of the new year and considerable foreign demand is still coming up. One 27,000-keg contract for nails is being placed by a single Eastern shipyard for new buildings.

Government orders for tin plate since September have run up to 400,000 to 500,000 boxes, of which about half is for the Allied Governments. Practically all the tin plate output of the first half of 1918 is now under contract.

Upper lake shipping ports have sent down their last iron ore cargoes, and the lake movement for the season is now estimated at 62,300,000 to 62,400,000 tons, December yielding rather a smaller total than seemed probable after the extraordinary performance in November.—*Iron Age.*

Hellen Out of Dart; Henry Takes His Place

WATERLOO, IOWA, Dec. 10—C. W. Hellen, for five years president and general manager of the Dart Motor Truck Co., has disposed of his interests in that concern and will retire from the business. He will be succeeded as president and general manager by H. H. Henry of Chicago, who is already on the ground. Mr. Henry was formerly with the Maxfer Truck Co. It is said that change in management forecasts a general reorganization of the Dart company.

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Urving G. Thomas, production and efficiency engineer of the Hercules Motor Mfg. Co., has resigned.

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A. G. Mahaffey is assistant branch manager at Cleveland for the Oakland Motor Car Co. He was formerly sales manager of the Gray Tractor Co., Minneapolis.

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E. A. Scheu, five years with Packard, is now eastern traveling sales representative for the King Motor Car Co., Detroit.

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Harmon J. Kline has resigned as designing engineer of the Olds Motor Works, Lansing, and is now in the Anti-aircraft Section, Carriage Division, Ordnance Department, Washington.

Men of the Industry

Changes in Personnel and Position

F. W. Grubb has been made sales manager for the Empire Tire & Rubber Co. in Minneapolis. He was formerly sales manager for the Union Supply Co., Toledo.

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H. B. Young is manager of the Cleveland branch of the Chicago Pneumatic Tool Co., manufacturers of the Little Giant truck. The territory extends from northern Michigan to New Orleans, La.

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William A. Carrell has been appointed engineer and works manager of the Erde Motor Co., Saginaw. He was formerly superintendent of the motor plant of the Milwaukee works of the International Harvester Co.

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Allan C. Chambers is assistant sales manager of the Russel Motor Axle Co., Detroit, in charge of sales promotion and advertising.

Emery Made Manitowoc Manager in Detroit

DETROIT, Dec. 8—Howard Emery, manager of the Manitowoc (Wis.) foundries and branch offices of the Aluminum Castings Co., Cleveland, has been made general manager of the company's interests at Detroit. He will assume his new duties about Jan. 1. No announcement is made of his successor at Manitowoc.

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H. Belden Joseph, assistant advertising manager of the Kelly-Springfield Tire Co., New York, has resigned to join the United States army.

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Edgar Apperson has been made General Manager of Apperson Bros. Automobile Co., Kokomo, Ind.

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B. F. Durham is service manager of the Harroun Motors Corp., Wayne, Mich.

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W. L. Van De Wiele has been made manager of the truck department of the Van Cortlandt Vehicle Corp., New York, Peerless car and truck distributer. He was formerly New York branch manager for the Mack Motor Car Co.

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A. R. Johnson has been made assistant advertising manager of the Motor Bearings Sales Division of the Hyatt Roller Bearing Co.

Navy Wants Mechanics

WASHINGTON, Dec. 10—The Navy Department wants 8000 men at once. An emergency call has been sent out for them. They are wanted for the ground personnel of the Navy Flying Corps. Their principal qualification should be skill in mechanical work; they must be first-class mechanics. After enlistment they will be rated as machinists' mates, carpenters' mates, quartermasters, coppersmiths and blacksmiths. Each class will be given special training. Applicants must be between the ages of 21 and 35 and it is stated that promotions will be made as rapidly as the progress of the applicant warrants.

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Standard Tire to Increase

KEOKUK, IOWA, Dec. 10 — The Standard Four Tire Co. of Keokuk has plans well under way to increase its capital stock to $3,500,000 and erect an enlarged plant. A portion of the new issue of stock will be used in erecting a new building 60 ft. by 300 ft., five stories. The new building will be equipped for a capacity of 2500 tires per day.

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Motor Cooling Patent Upheld

CHICAGO, Dec. 11—The exhaust operated circulating system patent of the Motor Cooling Systems Co., Baltimore, has been declared valid and infringed in an action brought by that company against the Smith Form-A-Tractor Co. The patent is No. 1,138,962. The case was heard by Judge George A. Carpenter in the United States District Court for the Northern District of Illinois, Eastern Division.

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Coast Dealer Takes Tractor

SPOKANE, Dec. 10—The Eldredge-Buick Co. has been appointed distributer of the Sampson tractor, manufactured by the General Motors Co. The territory involved covers Washington and Oregon and the provinces of Alberta, British Columbia and Saskatchewan.

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OBITUARY

R. E. Ingersoll Dead

R. E. Ingersoll, vice-president of the Reo Motor Car Co. of New York, died suddenly on Dec. 3. He was born at Randolph, N. Y., July 19, 1877. After finishing his education at the Chamberlain Institute he started his business career with John Wanamaker, in this city, as assistant buyer in the automobile and sporting goods departments. After severing that connection he went with the Pope Mfg. Co., Hartford, Conn., and at the age of 26 was placed in charge of its affairs at the St. Louis Exposition. In 1905 he became connected with the Reo Motor Car Co.

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Julius Andrae Passes Away

MILWAUKEE, Dec. 6—Julius Andrae, president of Julius Andrae & Sons Co., an old established jobbing house in hardware and accessories, died Sunday Dec. 2. He was 88 years old.

Urges Military Roads

WASHINGTON, Dec. 10—Director Logan Waller Page of the Office of Public Roads and Rural Engineering, Department of Agriculture, has sent to state highway departments a letter urging the adoption of a definite policy in good roads matters, and suggesting the necessity for selective highway construction as a means of relief for war-time transportation needs. Director Page urges the elimination of non-essential roads from next year's construction and obtaining effective guarantees for the construction of those which are essential. The keynote of the letter is the need for co-operation of all persons directly or indirectly instrumental in road construction.

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Fulflo Boasts Production

CINCINNATI, Dec. 10—The Fulflo Pump Co. has acquired five acres of ground at Blanchester and is erecting a two-story machine shop and foundry. It is expected that by March 1 the company's production will be up to 500 centrifugal pumps a day and that by midsummer 1000 a day will be produced. Cast iron, bronze, brass and aluminum pumps are made.

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Goodyear Hartford Branch Gutted

HARTFORD, Dec. 11—Three hundred thousand dollars' worth of tires and tubes were consumed in a fire which razed the branch of the Goodyear Tire & Rubber Co. here to-day.

General Motors Plans Opening Up Marquette

SAGINAW, MICH., Dec. 7—The General Motors Co. will open the Marquette plant in this city, and will start operations about Jan. 1, employing between 1000 and 1200 men. George H. Hannum, general manager of the Jackson-Church-Wilcox Co., will be in charge. This plant was originally constructed for the Rainier Motor Co., was taken over by the General Motors Co., and the Marquette Buick manufactured in it for some time. General Motors has secured large Government contracts, and the opening of this plant is doubtless part of the manufacturing scheme.

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To Reorganize Hale & Kilburn

NEW YORK, Dec. 10—The stockholders' committee of the Hale & Kilburn Co., Philadelphia, has adopted a plan of reorganization and is submitting it to stockholders. It is stated that holders of a large amount of both preferred and common stock have assented to the plan. The new capital proposed consists of $1,000,000 five to fifteen-year 6 per cent serial notes, convertible at the option of the holder at any time prior to Jan. 1, 1920, into preferred stock of the new company on the basis of $100 par value of the stock for each $95 principal of notes. The $1,000,000 new notes are to be offered to stockholders for subscription at $95 with a bonus of new common equal at par to the principal of the notes. It is stated that the company had unfilled orders on hand Jan. 1, 1916, of $2,038,847, and in the first 10 months of 1917 a total of $5,487,694 orders were received. It is also stated that the company has substantial contracts with the government. The company is a large manufacturer of steel bodies and other pressed steel parts.

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Reorganize Ford Tractor

MINNEAPOLIS, Dec. 5—The Ford Tractor Co. is being reorganized. The proposed plan of reorganization provides for the scaling down of the present outstanding stock of $10,000,000 and creating a new issue of securities of not more than $1,000,000.

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Storage Plant for Springfield

SPRINGFIELD, MASS., Dec. 10—The Springfield Auto Storage Co. has leased the buildings of the Eastern States Expositions to store cars shipped into this city. The railroad tracks are at the door and facilities for temporary storage are good.

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Texas Plant for Boone

CHIPPEWA FALLS, WIS., Dec. 8—The Boone Tire & Rubber Co., Chippewa Falls, Wis., is establishing a southwestern factory branch at Fort Worth, Tex., to be opened Jan. 1. The company maintains a large plant in Sycamore, Ill., and is completing its main works at Chippewa Falls, which will be ready at the end of the year. I. V. MacLean, president and general manager, is now in Fort Worth to supervise the establishment of the branch.

Current News of Factories

Notes of New Plants—Old Ones Enlarged

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Lakey Foundry Nearly Ready

MUSKEGON, MICH., Dec. 7—The new building of the Lakey Foundry & Machine Co. is practically completed and will be in operation about Jan. 1. The main building is 200 x 300 ft., which, together with a small power house, will cost about $200,000. Sub-government contracts through the Continental Motors Corp. have been obtained, and it is expected that the company will specialize in automobile castings and will employ about 600 men. The capacity of the foundry is about 100 tons per day.

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Won't Discontinue Pierce-Arrows

BUFFALO, N. Y., Dec. 10—The Pierce-Arrow Motor Car Co. has issued an official statement announcing that passenger car production will not be discontinued. According to this statement the company is now completing increased facilities for a greater output, and the production will not be decreased unless required by the Government. Pierce-Arrow cars will be built in proportion to the amount of material available.

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Canadian Maxwell in Walkerville

DETROIT, Dec. 6—The Maxwell Canadian sales office has been moved from Windsor, Can., to Walkerville, where the Chalmers Motor Co. has its Canadian headquarters. This consolidation of the offices is simply the Canadian phase of the situation here, whereby the Maxwell company has obtained a 5-year lease of the Chalmers Motor Co. It does not mean that the actual sales forces are consolidated, though Louis Logie is Canadian sales supervisor for both Maxwell and Chalmers.

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CHANGES IN CAPITALIZATION

DAYTON, OHIO, Dec. 6—The Dayton Bronze Bearing Co. has increased its capitalization from $10,000 to $50,000.

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CLEVELAND, OHIO, Dec. 6—The Commercial Auto Body & Mfg. Co. has increased its capitalization from $50,000 to $150,000.

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PONTIAC, MICH., Dec. 10—The Hess Pontiac Spring & Axle Co. has decreased its capitalization from $145,000 to $1,000.

U. S. Truck Production Increasing Rapidly

CINCINNATI, Dec. 6—The United States Motor Truck Co. is increasing its production rapidly and at present is carrying production on 150 trucks at all times. These trucks range from 2½-ton to the 5-ton capacity. Sufficient material is on hand to permit this expansion and the second floor of the assembly building now being used for storage can be devoted to assembling. The distributing force is being increased to care for the increasing production.

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Comet Building Ready Jan. 20

DECATUR, ILL., Dec. 10—Rapid headway is being made in the erection of buildings for the Comet Automobile Co., which will manufacture cars and trucks. It is expected that the first building will be ready for occupancy Jan. 20.

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More Room for Essex Tractor

ESSEX, ONT., Dec. 7—The Essex Tractor Co., Essex, Ont., is getting out plans for an addition to its factory, which will double its capacity. The new addition is for assembling and painting.

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Mitchell to Make Parts

CLEVELAND, Dec. 10—The G. F. Mitchell & Son Co., manufacturer of sheet metal parts, is to enter the production of automobile parts. A two-story plant, 300 x 300, is being completed. For some time a specialty has been made of battery boxes, hoods, etc. Brake drums and other parts will be added.

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Iowa Adds Universal Unit

OTTUMWA, IA., Dec. 10—The Iowa Motor Truck Co. is manufacturing a unit to fit all chassis with amidship gearsets, and which will convert these into commercial vehicles. This new universal unit is in addition to the company's unit for Ford cars. Tires of 34 x 4 size are supplied at additional factory cost. The company is establishing a branch in Omaha. H. H. Cannon will be in charge.

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Republic Completes Laboratory

ALMA, MICH., Dec. 7—The Republic Motor Truck Co. has completed its commercial laboratory, which is in charge of E. G. Pierce, recently appointed consulting engineer.

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Singer Signal in Factory

ST. LOUIS, Dec. 10—The Singer Auto Traffic Signal Co. has moved into a factory building at 3917 Olive Street, where 10,000 ft. of space is available. Owing to difficulty in getting parts, the distribution has been delayed but will begin at once. The device shows "stop," "right" and other signals at the tail light by pressing a button.

Establish Texas Plant for Car Production

CLEBURNE, TEXAS, Dec. 7—The Texas Motor Car Association, which is being organized for the purpose of constructing a plant at some point in Texas to manufacture automobiles, will have a capital stock of $1,000,000. George W. Cashin, manager of the Fort Worth office of the company, has been investigating the situation at Cleburne with a view of locating the proposed plant here.

Tractors Coming from Columbus

COLUMBUS, OHIO, Dec. 10—The Marvel Tractor Co., has been incorporated with an authorized capital of $20,000 to manufacture farm tractors. The incorporators are J. W. Freeman, E. T. Fox, C. E. Williams, Charles C. Green and J. M. Sheets.

Receiver for Marion-Handley

DETROIT, Dec. 7—The Mutual Motors Co., Jackson, Mich., manufacturer of the Marion-Handley, is now in the hands of receivers. The Detroit Trust Co. has been appointed receiver in bankruptcy. Some months ago this company was formed by the consolidation of the Marion Co. of Indianapolis and the Imperial Co. of Jackson. About a month ago the plant was shut down for an inventory, which is at present being completed.

Another Dividend on Milwaukee Motor

MILWAUKEE, Dec. 8—The federal court at Milwaukee has confirmed the action of the referee in bankruptcy at Milwaukee in declaring a fourth and final dividend of 6 per cent, amounting to $16,100, in favor of creditors of the defunct Milwaukee Motor Co., which went into the hands of a receiver on June 30, 1913. The total distribution in dividends is 41 per cent of proven claims of $267,993. The bankrupt estate is now being closed.

New Companies Formed

Latest additions to ranks of Automotive Industries

New Firestone Blow-out Patch

AKRON, Dec. 10—The Firestone Tire & Rubber Co. is adding to its already extensive line a special blow-out patch for distribution by jobbers exclusively. Deliveries are now being made.

Willis Files Schedules

NEW YORK, Dec. 10—The E. J. Willis Co., automobile jobber doing business at 85 Chambers Street, has filed schedules in bankrupty, showing liabilities of $82,163 and assets of $33,707.

Urge Motorcycle Dealers to Stock Up

MILWAUKEE, Dec. 10—The Harley-Davidson Motor Co. is sending letters to motorcycle and bicycle dealers urging them to stock up on motorcycles, bicycles, side cars and parts to obviate delay which may come from freight congestion.

Vail-Rentschler Adds Farm to Its Title

HAMILTON, OHIO, Dec. 10—The Vail-Rentschler Farm Tractor Co., has been incorporated with a capital of $500,000 to manufacture farm tractors. The incorporators are William J. Devanney, Thomas L. F. Morgan, A. Mannion, M. E. Ostendorf and Joseph Lemkuhl. The concern is a reorganization of the Vail-Rentschler Tractor Co., which has been in operation for about a year.

To Produce Moto Fuel

DAYTON, OHIO, Dec. 7—The Ohio Moto Fuel Co. is incorporated for $10,000 by L. E. Keller and George A. Franke.

Form Motor Bus Company

DAYTON, OHIO, Dec. 7—The Dayton Auto Bus Co. is incorporated for $2,000 by John H. Hanks and Arthur W. Miller.

DIVIDENDS DECLARED

TOLEDO, Dec. 7—Directors of the Willys-Overland Co. have declared a quarterly dividend of $1.75 per share on all outstanding preferred stock, payable Jan. 1 to preferred stockholders of record at the close of business Dec. 20.

PHILADELPHIA, Dec. 8—The Electric Storage Battery Co. has declared a dividend of $1 per share on both common and preferred stock payable Jan. 2 to stockholders of record Dec. 17.

CHICAGO, Dec. 8—The Stromberg Carbureter Co. of America has declared a dividend of 75 cents per share payable Jan. 2 to stockholders of record Dec. 15.

"Automotive Industries" Men Join Colors

NEW YORK, Dec. 10—Three members of the editorial staff of AUTOMOTIVE INDUSTRIES have joined the colors. Harold F. Blanchard, who first started with AUTOMOTIVE INDUSTRIES October, 1913, will become an Ensign in the aviation section of the U. S. Navy. He leaves at once for Boston, where he will study at the Boston Institute of Technology for a period of about six weeks; he then goes for instruction to an airplane factory and eventually will become either an inspector of airplane engine assembly or will have charge of a base repairshop. Eugene F. Spooner, who first became connected with AUTOMOTIVE INDUSTRIES in January, 1912, and who has been handling much of the local news, has left for Newport, R. I., where he will become an enlisted man in the navy. Harry F. Huppenbauer, who joined the staff of the art department in September, 1913, leaves to-day for Washington to take a position in the drafting department under General Crozier, chief of the ordnance department.

New York Buys Postal Trucks

NEW YORK, Dec. 8—The New York City Postal District has been added to the list of those in which government trucks are used for mail transportation. The Post Office Department has purchased about 150 motor trucks of three-quarter, one and one-half and three ton capacity which will be operated January 1. In six of the cities where the Government operated its own trucks last year there was a saving of $500,000. The plan has already been adopted in Chicago, Buffalo, St. Louis, Philadelphia, Detroit, Boston and Indianapolis, and has been successful in each. Post office officials say the plan will soon be tried in every large city. A post office garage will be ready for occupancy about Dec. 15. There will be 75,000 sq. ft. of floor space and 250 men will be employed.

Factories Lose Many Austrians

DETROIT, Dec. 7—Declaration of war on Austria-Hungary with the attendant removal of all alien enemies from the factories may remove from 5000 to 7000 workmen. For some time no foreigners have been employed unless they had already taken out their first citizenship papers. Though the shortage of skilled labor is quite acute, the above condition will not affect production to any great extent, as it represents such a small proportion of the whole. The Ford factory employs from 30,000 to 40,000 men.

174,274 Cars in Massachusetts

BOSTON, Dec. 8—The Massachusetts Highway Commission has registered 174,274 motor vehicles up to Dec. 1, a gain of 37,465, over the entire registration of 1916. Of this increase, 7814 were commercial vehicles and 29,651 passenger cars. On July 1, 2262 more passenger cars had been listed than for all of 1916. The number of dealers in Massachusetts is 2379, an increase of 402 over 1916. More than 211,000 operator and chauffeur licenses have already been issued, as compared with 168,000 in 1916. The figures follow:

	Total, 1916	To Dec. 1, 1917	Increase
Motor cars.....	118,615	148,266	29,651
Trucks	18,194	26,000	7,814
Total vehicles.	136,809	174,274	37,465
Motorcycles ...	10,713	11,065	352
Dealers	1,977	2,379	402

Reo Stockholders to Meet Dec. 18

LANSING, MICH., Dec. 7—The annual meeting of the Reo Motor Car Co. stockholders will be held Tuesday, Dec. 18, at 2 p. m., in the executive building. The report of the officers for the past year will be made and directors elected. It is stated that the truck business for the past year has shown a remarkable gain.

Maxwell Truck on Endurance Run

NEW YORK, Dec. 10—The Maxwell Motor Sales Corp., this city, is sending a Maxwell truck on a 2500-mile Southern trip under A. A. A. observation and sanctions. The truck is carrying a load of groceries from New York to the Government camp at Spartanburg, S. C., guaranteeing that the shipment will cost one-half the express rate. An average of 15 miles an hour is planned.

Fire Levels Nash Barracks

KENOSHA, WIS., Dec. 8—Large army barracks being completed in the vicinity of the plant of the Nash Motors Co. for the use of officers and enlisted men inspecting army truck construction, or being trained in the manufacture, maintenance, repair and driving of such vehicles, were almost totally destroyed by fire on the night of Dec. 3, about a week before the buildings were to have been turned over to the Government by the contractors. After a 5 days' investigation Government officers declared that the blaze resulted from the explosion of small cans of roofing cement. Work already has been started on the reconstruction of the barracks, which will accommodate from 150 to 200 men. Similar barracks are being erected at Clintonville, Wis., where the Four Wheel Drive Auto Co. is executing large Government contracts for army trucks.

Plan Increased Production of American "Egyptian" Cotton

TEMPE, ARIZ., Dec. 7—As a result of the growing demand for long-staple Egyptian cotton for use in the manufacture of the fabric the acreage of that variety of cotton in the Salt River Valley will be increased to more than 100,000 acres next year, as compared with about 35,000 acres this season. Growers of the long staple cotton have received high prices. As a result, land and rental values have increased enormously. Some irrigated tracts have been rented for $25 cash per acre, while other land has been rented on the basis of 15 per cent of ginned cotton, to be paid the owner of the land. All of this cotton-producing land is irrigated from the great Roosevelt dam reservoir. It is stated that notwithstanding the shortage of rainfall there is enough water in storage back of the dam to insure an irrigation supply for the next two years, even should there be no replenishing of the supply in the meanwhile.

Henderson and Hearne Drive Roamers

Editor of Automotive Industries: Some of the trade papers recently have been giving the impression that Eddie Hearne and Pete Henderson are driving Duesenberg cars. This is entirely untrue. Both these drivers are driving Roamer cars. Will you kindly co-operate with us and do what you can to correct in the future the misapprehension under which so many of the automobile men are evidently laboring.—Wm. D. McJunkin Advertising Agency.

McComb With Marmon Co.

NEW YORK, Dec. 11—H. G. McComb, chairman of the Metropolitan Section, S. A. E. and for years connected with the engineering department of the General Vehicle Co., but who has been doing consulting engineering in this city for the past 18 months, has joined the Airplane Engine Division of Nordyke & Marmon Co., Indianapolis, Ind.

Calendar

ASSOCIATIONS
1918

Jan. 3-4—New York Automotive Electric Assn. meeting.

Jan. 7-8—New York, National Automobile Dealers' Assn. directors' meeting with vice-presidents from Eastern States.

SHOWS
1918

January — Kalamazoo, Mich., Kalamazoo Automobile Dealers' Assn., Armory.

Jan. 2-9—New York, Salon. Automobile Salon, Inc., Astor Ballroom. John R. Eustis, Mgr.

Jan. 5-12 — New York Show, Grand Central Palace, National Automobile Chamber of Commerce.

Jan. 11-19 — Philadelphia, 17th Annual Show, Philadelphia Auto Trade Assn., Commercial Museum Bldg.

Jan. 11-19—Providence, R. I., R. I. Licensed Auto. Dealers' Assn., State Armory. Percival S. Clark, Mgr.

Jan. 14-19 — Rochester, N. Y., Tenth Annual Exposition Park. C. A. Simmons, Mgr.

Jan. 16-27 — Milwaukee, Wis., Milwaukee Automobile Dealers, Inc., Auditorium. (First 7 days, passenger cars; last 3 days, commercial cars. Bart J. Huddle, Mgr.

Jan. 19-26—Detroit Automobile Dealers' Assn., Overland Bldg. H. H. Shuart, Mgr.

Jan. 19-26—New York Motor Boat Show, Grand Central Palace, National Assn. of Engine and Boat Manufacturers.

Jan. 19-26—Detroit, Willis Avenue Overland Service Station.

Jan. 19-27 — Cleveland, Seventeenth Annual, Cleveland Automobile Show Co., Wigmore Coliseum. Fred. H. Caley, Mgr.

Jan. 19-28 — Montreal, Can., Montreal Automobile Trade Assn., Ltd., Almy Bldg. T. C. Kirby, Mgr.

Jan. 21-26—Manchester, N. H., Academy. Couture Bros.

Jan. 21-26—Scranton, Pa., Scranton Motor Trades Assn., Armory. Hugh B. Andrews, Mgr.

Jan. 21-26—York, Pa., Queen Street Tabernacle. York Automobile Dealers' Assn.

Jan. 21-26 — Wilmington, Del., Hotel Du Pont.

Jan. 22-24—Montreal, Can., Convention of all Men Interested in the Automobile Industry in Eastern Canada.

Jan. 22-26—Baltimore, Md., Baltimore Automobile Dealers' Assn. and Automobile Club of Maryland, 5th Regiment Armory.

Jan. 23-28—Allentown, Pa., Lehigh Auto. Trade Assn., Traylor Motor Co.'s Garage. P. W. Leisering, Publicity Mgr.

Jan. 26-Feb. 2 — Chicago National Show, Coliseum and Armory, National Automobile Chamber of Commerce.

Jan. 26-Feb. 2—Chicago, Salon, Elizabeth Room of Congress Hotel.

Jan. 26-Feb. 2—Harrisburg, Pa., Capital City Motor Dealers' Assn. J. Clyde Myton, Mgr.

Jan. 28-Feb. 2—Buffalo, N. Y., Buffalo Automobile Dealers' Assn., Broadway Auditorium.

Jan. 26-Feb. 2—Bridgeton, N. J., Bridgeton Auto Dealers' Assn. O. P. Riley, Sec.

February — Greensburg, Pa., Westmoreland Automobile Dealers' Association.

Feb. 5-9—Binghamton, N. Y., Binghamton Automobile Dealers' Assn., Kalurah Temple. William M. McNulty, Mgr.

February — Peoria, Ill., Peoria Auto and Accessories Dealers' Assn. W. O. Ireland, Mgr.

Feb. 9-16—Bronx, N. Y., 2d Battery Armory, Bronx Automobile Dealers' Assn. D. J. Barrett, Mgr.

Feb. 11—Toledo, Terminal Auditorium, Toledo Auto Show Co.

Feb. 11-16—St. Louis, Mo., St. Louis Auto Mfrs. & Dealers' Assn. Robert E. Lee, Mgr.

Feb. 11-16—Kansas City, Mo., Third Annual National Tractor Show.

Feb. 16-23—New York, Second Pan-American Aeronautic Exposition, Grand Central Palace and Madison Square Garden.

Feb. 16-24—San Francisco, Cal., San Francisco Dealers' Assn., Exposition Auditorium. G. A. Wahlgreen, Mgr.

Feb. 18-23—Grand Rapids, Mich., Automobile Business Assn., Klingman Building. Ernest T. Conlon, Mgr.

Feb. 18-23—Newark, N. J., N. J. Auto Exhibition, Co. G, First Regiment Armory. Claude E. Holgate, Mgr.

Feb. 18-23—Des Moines, Ia., Des Moines Automobile Dealers' Assn., Coliseum. C. G. Van Vliet & Dean Schooler, Mgr.

Feb. 18-23 — Springfield, Ohio, Springfield Auto Trades Assn., Memorial Hall. C. S. Burke, Mgr.

Feb. 18-23 — Waterbury, Conn., United Shows Co.

Feb. 18-24—Des Moines, Ia., Second Annual Truck, Auditorium. Dean Schooler & C. G. Van Vliet, Mgrs.

Feb. 18-25 — Pittsfield, Mass., State Guard, State Armory. James J. Callaghan, Mgr.

Feb. 18-27—So. Bethlehem, Pa., Fourth Annual (cars 18-23; trucks 25-27), Coliseum. J. L. Elliott, Mgr.

Feb. 22-Mar. 9—Brooklyn, N. Y., Brooklyn Motor Vehicle Dealers' Assn., Twenty-third Regiment Armory. I. C. Kirkham, Treas.

Feb. 25 - Mar. 2 — Bridgeport, Conn., Fourth Regiment Conn. Home Guard, State Armory & Casino. B. B. Steiber, Mgr.

Feb. 27-Mar. 6—Boston, Mass., Salon, Boston Automobile Dealers' Assn., Copley Plaza Hotel. Chester I. Campbell, Mgr.

Mar. 1—Lyons, France, Third Sample Fair.

Mar. 2-9—Pittsburgh, Pa., Automobile Dealers' Assn. of Pittsburgh, Motor Square Garden. John J. Bell, Mgr.

Mar. 6-9—Clinton, Ia., Clinton Automobile Dealers' Assn., Coliseum.

Mar. 19-24—San Francisco, Cal., Motor Truck Dealers of San Francisco, Auditorium. Ivan R. Gates.

Mar. 19-24—Cedar Rapids, Ia., Cedar Rapids Auto Trade Assn., Auditorium.

Apr. 9-13—Stockton, Cal., San Joaquin Auto Trade Assn. Samuel S. Cohn, Mgr.

Sept. 23-28 — Chicago, National Accessory Show for Fords, Coliseum.

S. A. E.

Jan. 10—New York, Automotive Dinner at Hotel Biltmore.

Feb. 1—Chicago, War Dinner during Winter Meeting.

Engineering

American Society of Heating and Ventilating Engineers.

Mining and Metallurgical Society of America.

DECEMBER

17—Amer. Soc. Heat. & Vent. Engrs. monthly meeting New York section.

20—Mining & Met. Soc. Amer. Monthly meeting New York section at Engrs. Club.